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AMERICAN JOURNAL OF PSYCHIATRY

THE PSYCHONEUROSES.*

PROBLEMS AND LINES OF INVESTIGATION.

BY C. MACFIE CAMPBELL, M. D.

In the scientific field periods of rather acrimonious discussion and tension alternate with more placid periods in which there is a willingness to accept contributions of data no matter from what side they come. Ten years ago the psychoneuroses were a topic in the discussion of which a great deal of heat was usually engendered. At the present time one does not need to gird on one's armor before making a few remarks on the subject. Perhaps this greater tolerance is indicative of a general change in the point of view toward psychiatric problems. The pupils of the various schools have found their exclusive formulæ too cramping for comfort, and at the expense of some personal effort and pain have managed to break loose from their too narrow creeds. This may be seen in the discussion of the deteriorating psychoses, where a great variety of factors from different fields of research have to be carefully weighed and no adequate formulation can be based on the data from one field alone. So in regard to the psychoneuroses, even those who are continually looking up the family tree for the fruit of knowledge do admit to a certain extent the influence of the environment although they may take a rather languid interest in it. The psychoanalytic school may rarely refer to the endocrine glands, but seem to be nibbling at the old fashioned doctrine of the value of effort and work ("active therapy"), in addition to a pure psychotherapy. Even the most purely "scientific" workers with categories hitherto limited to those of the microscope and test-tube do not hesitate to make reference to the

* Read at the seventy-eighth annual meeting of The American Psychiatric Association, Quebec, Canada, June 6, 7, 8, 9, 1922.

dreams of their patients, perhaps merely a concession to the vogue of the moment and not pursued very far. Hitherto the presentation of a psychoneurotic case from the standpoint of one school would be so different from that made from the standpoint of another school that the uninitiated might well doubt whether it was the same topic that was being discussed. Perhaps it was not actually the same topic, each worker presenting a detailed discussion of certain reactions abstracted from the totality of the situation; it was not always kept in mind that the problem presented by the psychoneurotic patient is neither this nor that symptom, but the inefficiency of the individual in the social situation which he has to meet. It is important for the physician always to keep in mind the numerous factors upon which the efficiency of the individual depends. It depends upon:

1. The functional efficiency of the various systems of the body, cardiovascular, respiratory, etc., and among these systems two systems have a very special importance, the central nervous system and the endocrine system; defects in the other systems being compensated for more or less in a variety of ways, while any inferiority in the endocrine or central nervous system strikes in a very fundamental way at the behavior of the individual.

2. The constitutional equipment of the patient in respect to
   (a) The crude fundamental emotional reactions,
   (b) More delicate and less easily classified reactions involved in the personality.

3. The special experiences which may have sensitized the individual to special topics or situations (as in the "conditioned reflex").

4. Physiological factors in relation to the mode of life of the patient, *e. g.*, involving excessive work with consequent fatigue, alcoholism, etc.

5. The actual life situation and its relation to the constitution of the patient, *e. g.*, an unsuitable marriage, distasteful occupation, uncongenial social environment, may play an important rôle in the failure of the individual to maintain a healthy balance.

In order to understand the causal factors involved in a breakdown, as well as the psychological genesis of certain striking symptoms, and in order to give honest treatment to the patient, due appreciation of these factors is necessary, and a systematic

examination of the patient from all these points of view should be obligatory.

It will not do to allow our patient to drink himself to death while we are patiently analyzing the roots of his alcoholism, nor is it adequate as a rule merely to make the environment dry while we pay no attention to the fundamental cravings and dissatisfactions which express themselves in this disguised way.

It is seldom that one can put one's finger upon a single cause, as the whole explanation of the disorder. One usually finds that factors from these various levels may each contribute something to the total upset, and it is a delicate matter to appreciate fully the value of each component.

From the point of view of treatment, it is our business to modify whatever can be advantageously modified.

1. With regard to the simple systems, one must see that adequate attention is given to whatever somatic defects a thorough examination reveals. Here, of course, we have to be on our guard against the exaggerated over-emphasis on certain topics which may be due to the vogue of one or other conception at a certain period whether it be eye-strain or uric acid or focal infection or endocrinopathy.

2. The constitutional equipment cannot be modified, but the way in which it has been conditioned by past experiences can be modified; if the patient has been sensitized to certain topics in certain ways, the discussion of these various topics may well lead to de-sensitization. Much of the benefit from discussing frankly the sex life of the patient is because it removes from the patient's mind that feeling of undue fear or shame or inferiority which had become associated with it through the influence of the early environment.

In dealing with the personality of the patient we may analyze it into its cruder components and into the more complex components. The cruder components would be represented by the coarser emotional reactions, such as fear or anger, and we have to realize that there is a great deal of individual variation in this regard. One patient reacts to fear with fainting, whereas another is struck dumb. Vomiting in some patients is elicited by disgust; in others by other types of embarrassing situations.

3. We may have to accept these special forms of sensitiveness, but strive to avoid their being elicited by situations which should not make much demand upon the emotional life; we also strive to prevent their being woven into the patient's life for the purpose of gaining privileges or immunities.

4. The attention to the patient's actual habits and modes of life, and 5, the endeavor to find a situation which will be congenial to the patient are very common-sense and obvious requirements, which are so obvious as to be sometimes ignored by the more scientific.

To analyze one's cases along the above lines does not give that unitary formulation which is so attractive, and which can be had if we utilize widely the concept of instinct, or work with the elusive concept of the libido. This analysis, however, does more justice to the complexity of human nature and to the various levels at which the integrity of the total reaction can be assailed. It also encourages very specific research along definite lines on the part of workers whose interests may be very divergent. One may grant the very important rôle played by emotional conflicts in the individual life, and yet may wish to know why in the individual case one system rather than another bears the brunt of the conflict. One may see that the symptom is the representative of repressed factors, and we can refer to it as a symbol, but the question is why that symbol is chosen rather than a variety of other symbols. Those who are working exclusively at the psychological level tend to suggest that the choice of this special symbol is determined very largely at the psychological level, while, as a matter of fact, the key to the development of the special symptom may have to be found at the physiological level. We are not entitled to assume that vomiting, even though utilized for purposes of psychological adaptation, is necessarily determined by its rôle in relation to the complex mechanism of disgust. It is possible that the gastric sensitiveness may have a much simpler origin. So with palpitation and other cardiac symptoms, their origin may largely be determined at a purely physiological level. It is a very difficult matter to determine how far various subjective feelings (*e. g.*, dizziness, fatigue, etc.) are to be considered in the light of a possible emotional background, and how far they are the expression of some very simple organic condition, which it may, however, be

very difficult to test, such as some anomaly in the functions of the endocrine system. Emphasis on this simple type of disorder is the special contribution which Adler has made when he has insisted upon the rôle of organic inferiority in many cases of psychoneurotic adaptation. On the other hand, there are cases where we have no evidence of organic inferiority, and where it does not seem justifiable to assume any such crude anomaly, although it is always difficult to meet the dogmatic assertions of those who take it for granted that there must be some such anomaly at the basis of the trouble.

In the following case, for example, it does not seem justifiable to assume that there is any such simple physiological basis or organic inferiority to explain in part the clinical picture. The case has been reported in some detail by Dr. Peck.[1]

The patient, nineteen years of age, was brought to the Boston Psychopathic Hospital on a stretcher; she only spoke in a hoarse whisper, complained of being extremely weak and of various aches: her appearance was that of a pronounced invalid. No organic condition was found to account for her symptoms: There was no indication of any endocrine disorder. Within two months the patient was an active helper on the wards.

Such an asthenia and aphonia are sufficiently common; on the other hand the personality of the patient was remarkable. Of attractive appearance, pleasant during an ordinary interview, she seemed to delight in causing the maximum of annoyance to others; she was selfish, taunted the other patients, found out the weak spot of each one, undermined the discipline of the ward, in a great variety of ways made herself obnoxious to patients, nurses and employees. From early life she had shown a pronounced tendency to tease and torment.

The patient showed no affection for others, nor special interest in the other sex; she gave no indication of any sex tension, denied autoerotism or other sex activities. At the same time she showed a tendency to discuss sex topics, especially with prudish patients, and was alert to any hints of scandal. In this connection the following data were of some interest: There had been a sex trauma (exhibitionism) at eight; enuresis nocturna till ten, occasionally

[1] Journ. of Abn. Psych.

enuresis diurna; night terrors between the ages of seven and twelve, dreams of being chased.

In this case we have a girl of apparently sound physical constitution, with no evidence of any special idiosyncrasy in the type of crude emotional reaction; the father had had some functional disorder at sixteen, the mother had twice had a nervous breakdown. There had been a sexual trauma, and beneath the somewhat sexless behavior of the patient was a certain interest in sexual affairs. There had been little special strain in the external situation to explain the development of invalidism.

To formulate such a case on the basis of any hypothetical organic inferiority would be to go beyond our facts. To correlate the various clinical features, the hysterical symptoms (asthenia, aphonia) and the character traits, with anomalies of the sex instinct, might be done with the expenditure of some ingenuity. Similarly one might try to compound the clinical picture out of a number of hypothetical instincts. If we wish to remain, however, on an absolutely sound basis of fact, we have to remain largely at the descriptive level, and while calling attention to the anomalies of the sexual life, would have to admit that the reactions of the total personality could not at present be resolved into any simpler elements; yet the whole difficulty in the treatment of this patient was determined by these very personal traits which could neither be related to physiological factors nor to definite instinctive elements.

In such a case we realize that while certain simple physical factors may be of importance, and while certain symptoms may be obviously related to the sex instinct, the total inefficiency of the patient may be dependent upon personal traits which have to be studied at their own level; these personal traits may offer the important problem in management and in relation to the formation of useful social habits. In this case there was so little possibility of modifying the personal traits, and a sufficiently tolerant environment was so difficult to find, that the patient has had, after a prolonged period of intensive study and careful management, to be placed in a hospital for the insane.

In the following case the importance of the disorder at the physiological level was very obvious, although from the practical standpoint it was not easily modified.

The patient, a woman of twenty-six, had for some years suffered from a feeling of exhaustion and inadequacy, insomnia and depression; she was so dependent on her mother's attention that she made quite a scene sometimes if her mother wanted to leave the house; she had several times turned on the gas, apparently to make an impression on her mother.

Although the patient complained much of weakness and exhaustion, and on this account had given up work outside, she worked at home quite well; was never idle a moment. The patient was very stout (153 pounds; height, 5 feet 1 inch); her hands were stubby; some hyperidrosis and flushing; large sella turcica with possible slight erosion of the dorsum; no glycosuria after 150 grams glucose by mouth; basal metabolism normal; hyaline casts in urine, but renal function satisfactory (phthalein test). Menstruation had never been normal; onset at twelve years, profuse and continuous for months, somewhat modified by operation at seventeen.

The patient dated her nervous symptoms from an episode at the age of twenty-two when she felt temporarily paralyzed, and could not open her mouth. The death of her father when she was sixteen made her stay much more at home and made her more dependent on her mother.

In this case the physical symptoms indicate a defect in the endocrine balance; the somewhat immature emotional life of the patient might be attributed directly to this, or it might be considered as secondary to the gynæcological symptoms, which so seriously crippled her social outlook; or it might be considered as a more or less independent anomaly, another manifestation of the inferior equipment of the patient. The formation of certain habits of adjustment had probably been fostered by the solicitous and not altogether judicious mother.

The patient gave no admission of definite sex conflict; she had however felt much embarrassed by the gynæcological situation, and considered the sexual topic tabu; she had shown a quite unusual interest in the pregnant women in her district.

In this case it is justifiable to emphasize the fundamental rôle of the endocrine anomaly in the clinical picture, but this does not mean that we can look upon all the other reactions of the patient as determined by this anomaly or by reactions to it. One can,

however, consider the possibility that her immature emotional life was, to a certain extent, a function of the endocrine disorder. At the same time the general balance of the personality has got to be given its due weight, and some of the patient's invalidism was, no doubt, due to habits fostered by the environment.

In the third case, a girl of nine, there was no such evidence of any fundamental disorder of the simple bodily systems.

The patient was admitted to the Boston Psychopathic Hospital because of obsessive behavior, tantrums, peculiar phantasies about the death of her mother; she would not undress in the presence of her mother; she was afraid at night, wanted to have a flat-iron in bed with her.

The patient had been exposed to several sex traumata; there had been some autoerotism; she had been as a young child most injudiciously caressed by her father, and she was very desolate at the age of six when her father died. After that time her character had changed considerably.

In this case with no demonstrable defect in the simple somatic systems, we find the child at an early age exposed to several situations which would stimulate the sex instinct; perhaps she may have gone part way to meet the sexual experiences. The environment had been in many respects unfavorable, the girl had come under unfortunate personal influences, had not got from her mother the best guidance in personal habits.

In this case there seems no reason to assume any simple physiological disorder. It seems justifiable to assume a sexual instinct somewhat precocious, or perhaps only precociously elicited, and an inability of the whole individual to deal with these factors in an adequate way. Here the formulation of the case in terms of the sexual instinct or of the libido with all its substitutive manifestations and reactions might do justice to the situation.

The fourth case is a woman of thirty-seven with regard to whom the diagnosis might be discussed in detail, but who presented some of the mechanisms of the psychoneuroses in a very complex setting of changed personality with periods of very special behavior.

At the beginning of her disorder, when she was thirty-four years of age, she became over-religious and showed obsessive cleanliness, washing her hands every fifteen minutes. At a later period she had an episode of unconsciousness for a period of two hours.

Later there were very erratic episodes, and she would have periods of glossolalia (talking in jargon).

This case is similar to the preceding case in the absence of any obvious somatic disorder, in the absence of any early indication of a special emotional type of reaction. While in the preceding case there had been undue stimulation of the sexual instinct at an early age when it might well prove impossible for the immature child to assimilate these elements, in this case there was no history of any disturbing sex episodes throughout the early part of her life. There was, however, early indication that while there had been no specially disturbing external situation, the inner balance had been a matter of considerable difficulty. She had been extremely self conscious in relation to the other sex; she was ill at ease with men; she was much more retiring socially than her fellows. Throughout the twenties she had lived a strikingly simple and uneventful life. When she broke down, however, there came to the surface striking references to repressed sexual interests, and she told of having lived a repressed life of fantasy in which various people had played an important rôle. She had lived out many romantic attachments in this way, and she also indulged in grandiose day-dreams. "Since five years old I have had a fatal weakness for men." As to her ruminations on marriage, "It seems as though I would go mad thinking of such things." She had managed to repress her thoughts, she claimed, until about the age of thirty; till then her mind had dwelt on purity; then a change had come and she thought of evil things, "A pig-pen was clean compared to me."

Human adaptation consists in the balance between lower and higher functions, and the balance may be disturbed either by the weakening of the higher or by the greater insistence of the claims of the lower. The claims of the lower may become more insistent owing to physiological changes (due *e. g.* to alcoholism, to peripheral irritation) or owing to external situations (temptations). The strength of the higher functions may be reduced owing to the absence of reinforcing stimuli (moral support, congenial work) or owing to the inability to continue for an indefinite period what may be possible for a limited period.

In this last case we see an individual in whom we need not assume any somatic disorder, but in whom there had been developed

undue emotion associated with the topic of sex, partly due to early repressive influences, in whom there had not been cultivated frank habits of social intercourse with the other sex; the ensuing balance was able to be maintained for a limited period, but not indefinitely. Here, too, it is not difficult to formulate the case in terms of the sexual instinct, and the libido with its various ramifications.

SUMMARY.

In the large group of psychoneurotic patients, the main emphasis has not to be laid upon the same factors in all the cases. In some cases the disorder of a somatic system plays an important etiological rôle; in some cases there are definite emotional idiosyncrasies; in some patients special experiences have sensitized the patient in certain directions; in some there has been, even with fair equipment and with no obvious disorder of the simple emotional reactions, a balance impossible to maintain for an indefinite period. In some there are personal traits of very special nature which cannot be reduced to simpler elements. In the formulation of each case one must take into account the possibility of a disorder at each of many levels. In working at this large group of patients we still require very much more information as to the rôle played by the simple organic functions, while not neglecting the complicated development of elaborate psychological reactions. The detailed analysis of the special determination of the specific psychological reactions has been carried further than the other lines of investigation, owing to the enthusiasm of the psychoanalytic school. There remains much work to be done in regard to the rôle of the various systems (cardio-vascular, gastro-intestinal, etc.) in the setting of the emotional reactions; and the study of the personality along lines analogous to those suggested by Hoch and Amsden is an important field for further research.

DISCUSSION.

DR. BRILL.—What I gathered from Dr. Campbell's very interesting paper, is that some cases can be treated in one way, some in another way, all of them must be thoroughly examined physiologically and psychologically before one proceeds with the special methods. In discussing the treatment of cases Dr. Campbell was very careful not to trespass forbidden ground. He used the term psychoanalysis only once. Evidently he tried hard not too offend anyone, and yet it was very plain that he often referred to psycho-

analysis. The paper was very illuminating, the case described was very interesting, but after all the pioneers in psychoanalytic therapy always expressed the same views. Freud himself never claimed that every case should be treated or cured by analysis, on the contrary he always maintained that only selected cases can be benefitted by psychoanalytic therapy. Only after a lot of quacks and ignorant physicians have taken it up and proclaimed it a cure-all have some serious-minded persons become confused as to its sphere of application. However, the patient described by Dr. Campbell it seems to me was a fine case for psychoanalysis, and I was very sorry to hear that she had to be sent to a state hospital for the insane that certainly was no solution of the problem. If there was nothing wrong physically, nothing wrong with the endocrine glands, or with any other somatic function psychoanalysis should have cured the patient. To be sure I have in mind real psychoanalytic therapy by a psychiatrist experienced also in psychoanalysis. I doubt whether this patient had the benefit of such treatment. I cannot imagine that this patient who annoyed the others by talking sex would refuse to cooperate if skilfully managed by a physician. Psychoanalysis requires much patience and time, but in experienced hands when applied to the proper cases it does more to adjust the patient than any other therapy. I maintain that it is wrong to urge the patient into some vocation that he has not selected himself; adjustable people need no such advice.

In this connection I wish to cite briefly a case referred to me by Dr. Beverly R. Tucker in 1911. The patient had been treated for several years privately and in sanitoria. Neither Dr. Tucker nor any other physicians discovered any organic disturbances. He might have some focal infection in the colon or in some other obscure spot, but at that time it was not found. He suffered from a very typical compulsion neurosis, the main symptom was a mysophobia, he was afraid of dirt, and in constant dread lest he might contaminate others. He could not move anywhere where he did not smell or see some chemical. This sensitiveness was aggravated by the fact that his father had been a druggist, and he himself was a salesman of chemicals. It seemed logical to some to advise him to give up his vocation, but that only helped the "flight from reality," the patient was just as uncomfortable as before. After treating him for five months he became well and returned to his vocation as a salesman of chemicals. About two years later on a visit to New York he casually told me that he gave up selling chemicals, not because, he was afraid of handling them, but because it was too burdensome a vocation, and, last but not least, he never would have taken it up if it had not been for his father, to whom he was abnormally attached. He chose to sell perfumes. Now as to his psychoanalysis, it was found that in early childhood he was very sensitive to odors. He took pleasure in indulging in all kinds of filthy odors which he kept up for many years despite punishment. His neurosis became manifest after his mother died of cancer of the intestines. I took the patient through his childhood and adult life, and showed him how he developed his phobias,

doubts and obsessions and he made a complete recovery which he maintained ever since. I would also call attention to the fact that his vocation is a sublimation of his early desires for odors, and as similar mechanisms are found behind most vocations that are chosen by people, I feel that it is wrong for the doctor to urge the patient into some vocation that he himself would not select.

In brief I agree with Dr. Campbell that different cases need different treatment but I feel that the last case should have been treated and cured by analysis.

DR. FARRAR.—It would be interesting to know whether Dr. Campbell treated the young man with the emetic reaction to whom he referred, by recommending another fiancée.

DR. CAMPBELL.—In answer to Dr. Farrar, I would say that I was saved embarrassment through not having been consulted by the young man; the matter was brought to my attention incidentally.

With regard to Dr. Brill's suggestion of psychoanalysis in the first case, that, of course, was what occurred to the physicians in charge of the patient, and for that purpose we kept the patient for many months in the hospital. It was absolutely impossible for us to get into close touch with the patient, which is absolutely essential for any prolonged psychoanalytical investigation. Apart from the sex life, she was of a personality which made it difficult for her to take advantage of the help offered. We did everything possible for many months to try and do what we could for her. We could not send her home, because the mother said if she came home, the landlady would make them move. We could not send her to her aunt, because the aunt said if she came there, she would move. She was returned to the hospital from a tolerant boarding house. So the only place this girl could be taken care of was, unfortunately, in a hospital for the insane, which was, of course, no solution of the problem of re-making this girl.

BLOOD CHEMISTRY IN MENTAL DISEASES.*

With a Report on the Findings in 229 Consecutive Admissions to Bloomingdale Hospital.

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In an endeavor to determine the blood chemistry findings in mental diseases, a routine examination of all admissions to the hospital was instituted.

In the beginning, the blood was examined quantitatively for non-protein nitrogen, urea, creatinine, creatine and dextrose. Later the list was increased to include uric acid and chlorides. The examination for urea, creatinine and creatine was discontinued after over sixty cases were examined. The findings obtained were essentially normal.

The methods used were those of Folin and Wu,[1] and of Whitehorn.[2]

There is great diversity of opinion as to what constitutes normal findings in blood chemistry. Four sets of normal values by four different authorities are given as illustrating this. Values are expressed as milligrams per 100 c. c. whole blood.

	Gettler and Baker.	Folin and Dennis.	Meyers and Fine.	Hawke.
Non-protein nitrogen.....	30- 45	22 - 37	25- 30	25- 35
Dextrose	50-120	90 -100	90-130	80-110
Uric acid	1- 3.5	0.7- 3.7	1- 2	1- 3
Chlorides, as NaCl.....	450-500	490	457	650

This table is copied from Weston[3] with addition of Hawke's[4] figures.

From a study of these and other tables and from the author's own experience, the following are given and will be considered as normal values in this article:

Non-protein nitrogen	22 - 37
Dextrose	80 -120
Uric acid	0.7- 3.7
Chlorides	450 -525

* Received for publication November, 1921.

There have been comparatively few studies published on this subject of blood chemistry in mental diseases.

NON-PROTEIN NITROGEN.

Weston [3] reported normal findings in thirty cases of mental diseases. Uyematsu and Soda [5] examined the blood of thirty-two cases of catatonic dementia præcox. The non-protein nitrogen varied from 26 to 56.8 mgm. per 100 c. c. of blood and averaged 34.9 mgm which was practically the same as the average of their ten normal controls. Rappleye [6] reported low urea findings during catatonic states but did not examine for non-protein nitrogen.

DEXTROSE.

The dextrose findings have been reported more extensively. Weston [3] found them normal in thirty cases. Raphael and Parsons [7] "agree that the fasting levels are well within the normal range and that they in themselves carry little diagnostic value." Kooy [8] reported a large series of cases. In ten cases of dementia præcox, the fasting levels varied from 76 mgm. to 116 mgm. Nineteen cases of melancholia ranged from 93 mgm. to 133 mgm., but only four were above 120 mgm. In three cases of psychoneuroses, the finding were 104 mgm., 109 and 102 mgm., and 147 mgm., respectively. Six cases of confusional insanity ranged from 84 mgm. to 166 mgm., and there was often great variation in the same patient, but as the patient recovered, the blood sugar returned to normal. Five cases of mania ranged from 83 mgm. to 167 mgm., but in four cases is was below 109 mgm. Six cases of "mania like psychoses after Spanish influenza," ranged from 74 mgm. to 127 mgm. In only two cases were the findings above 115 mgm. Thus we find that Kooy found no consistent rise in blood sugar taken after 12 hours' fast, but that confusional insanity showed the highest findings. The vast majority of cases showed normal findings.

NOTE.—Both Raphael and Parsons, and Kooy did sugar tolerance tests on all their cases and report special curves of assimilation. Only their fasting blood sugars are being considered in this article.

Uyematsu and Soda [5] examined thirty-two cases of catatonic dementia præcox and found the blood sugar to vary from 77

mgm. to 142 mgm., and to average 99 mgm. As this was considerably above the average for their controls (82 mgm.), they conclude "the amount is noticeably increased when compared with the normal." Fifteen cases, 47 per cent, showed higher values than the highest of the normal.

Wuth [9] summarizes his work as follows:

> The work consists of the examination of the serum sugar of 30 cases of melancholia, 40 cases of dementia præcox, 15 cases of general paresis, and 10 of epilepsy. We found an increase in blood sugar in 18 cases of melancholia, 15 of dementia præcox, 7 of general paresis, and in only 3 cases of epilepsy. The averages are as follows:

Melancholia	115	General paresis	112
Dementia præcox	107	Epilepsy	105

URIC ACID.

Folin and Dennis [10] reported normal uric acid findings in the bloods of thirty-eight cases examined at the Boston Psychopathic Hospital.

Adler and Ragle [11] examined the blood of 156 cases at the Boston Psychopathic Hospital. They report: "It is interesting to note that all are within the normal limits, the average being remarkably uniform. It is further interesting to note that the highest quantities of uric acid were determined in patients that were either unclassified or not insane."

Weston [8] reported the uric acid of the blood normal in thirty cases of mental diseases.

Uyematsu and Soda [5] examined thirty-two cases of catatonic dementia præcox and reported a range of from 0.5 mgm. to 3.2 mgm. with an average of 1.6 mgm. As the average for their controls was 2.3 mgm., they consider that the blood uric acid findings in catatonic dementia præcox are "decidedly lower than normal."

CHLORIDES.

Ishida [12] reported that in five untreated cases of catatonia, the chlorine content of the blood varied from 0.199 to 0.220 per cent. Guthrie [13] confirmed low findings for the chlorine content of the blood by a study of fifteen cases, but failed to give figures or to

state the method used. Rappleye[8] also reported low chlorides in catatonia but gave no data.

Weston[9] found the blood chlorides normal in thirty cases of mental disease. Ten of these were cases of dementia præcox but none was in a catatonic state at the time of the examination.

The cases reported in this study are grouped according to diagnosis. Every case reported was presented at staff conference and the diagnosis arrived at after discussion. While it is recognized that any system of classification of mental disease is unsatisfactory, it is felt that the scheme followed here is the most satisfactory.

Because of possible effects of age, sex, hours of fasting previous to withdrawal of blood, *special mental state at the time of drawing blood* and *physical condition at the time of drawing blood,* these are all noted. Negative findings are not given. In nearly all cases, the blood was taken within less than one week after admission of the patient. The Wassermann test was done on the blood of all cases, and was negative unless otherwise noted. Urine analysis was likewise done on all cases and was negative unless otherwise noted. Other laboratory procedures were done as indicated and any positive findings are noted. Very complete mental and physical examinations were made on all cases. Where the space under "Physical state" is blank, it means that there were no organic or neurological findings and no evidence of any abnormal physical condition. Lack of space prevents giving as full data as could be desired; nevertheless, no essential fact is omitted. The blood chemistry findings are expressed in milligrams per 100 c. c. of whole blood. The chlorides are expressed as sodium chlorides.

MANIC-DEPRESSIVE PSYCHOSIS.

Depressed Type.

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
1	F	56	12	Agitated, restless, weary, depressed.	40 lbs. under weight, diabetes for 1 year.	39.9	480	...	...
1	One month later.		12	Agitated, restless, weary, depressed.	40 lbs. under weight, diabetes for 1 year.	29	216	...	...
2	F	54	12	Mildly depressed, loss of interest.	.....	24	95	...	...
3	M	70	12	Mildly depressed and apprehensive, a little suspicious.	.....	30	102	...	...
4	F	70	4	Anxious, agitated, delusional..	Weakness rt. face, later hemiplegia. B. P. 228/104.	39	133	...	...
5	F	46	3	Apprehensive, irritable, depressed, delusional.	Teeth crowded, undernourished.	35	83	...	...
6	F	28	12	Dazed, stuporous, doesn't talk..	Took 4 tablets of bichloride 4 weeks ago.	43.9	100	...	...
6	Two days later.		12	Dazed, stuporous, doesn't talk..	B. P. 178/106. Urine shows casts.	39.9	87	...	...
6	Four mos. later.		4	Clearer	B. P. 178/106. Urine shows casts.	36.5	118	...	...
7	M	33	3½	Apprehensive, depressed	Under weight, teeth poor..	37.5	105	...	...
8	F	54	12	Agitated, very restless, vague hallucinations.	.....	37.5	90	...	...
9	F	37	12	Retarded, under-active, self-accusatory.	15 lbs. under weight.....	24.9	110	...	...
10	F	37	12	Depressed, worried, under-active.	Masculine hair dist.....	28.5	100	...	...
11	M	16	12	Very mildly depressed	.....	29.4	95	...	...
12	F	45	12	Depressed, suicidal, clear.....	Poorly nourished; thyroid slightly enlarged.	51	125	...	...
13	F	38	1	Under-active, depressed, ideas of reference.	B. P. 160/95	30	181	...	...

MANIC-DEPRESSIVE PSYCHOSIS—(CONTINUED).

DEPRESSED TYPE—(Continued).

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
13	One day later.		12	Under-active, depressed, ideas of reference.	B. P. 160/95	29.5	125	2	...
14	F	26	4	Mildly depressed, self-depreciative and self-accusatory.	.....	42.5	95	...	...
15	F	33	4	Suicidal, clouded for recent past.	B. P. 150/90. Occasional hyaline cast.	38.8	106	...	...
16	F	36	12	4th attack, quiet, well behaved, slightly apprehensive.	.....	28.5	131	1.4	...
17	M	51	12 ?	Essentially normal	.....	37.5	128	2.3	...
17	One week later		12	Essentially normal	.....	39.5	105	3.5	...
18	M	69	12 ?	Agitated, depressive delusions..	.....	36.3	155	1.9	...
18	One week later		12	Agitated, depressive delusions..	.....	37.5	97	1.8	...
19	F	48	12	4th attack, alert, tense, critical, suicidal.	.....	29.2	114	1.4	...
20	F	65	12	Worried, apprehensive, vague delusions.	Under weight, weak	25.9	117	1.1	...
21	F	56	12	Depressed, inadequate	B. P. 200	34.2	108	1.7	...
22	F	34	12	2d attack, restless, over-active, sad, distressed.	.....	27.9	133	1	...
23	M	50	12	Under-active, self-accusatory, suicidal.	Coarse tremor, fingers, deep reflexes exaggerated, changes fundus rt. eye.	26.6	111	2.4	...
24	M	35	12	Very mildly depressed.....	.....	28.6	133	2.8	...
25	F	37	12	Restless, fearful, confused, slightly delirous, possibly hallucinated.	Pupils dilated, sluggish, tremor of body, poor circulation.	21	129	.9	...

MANIC-DEPRESSIVE PSYCHOSIS—(CONTINUED).

MANIC-DEPRESSIVE PSYCHOSIS—(CONTINUED).

DEPRESSED TYPE—(Continued).

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
26	F	27	12	4th attack, self-depreciative, slightly agitated.	15 lbs. under weight.....	27.1	104	1.4	...
27	M	28	12	Self-accusatory, worried, mildly depressed, apprehensive.	.....	29.1	100	.7	...
28	F	..	12	Depressed, fearful, no energy..	Undernourished B. P. 160..	27.3	130	1.3	...
29	M	53	12	Mildly depressed, restless, inadequate.	Undernourished, deaf, abdominal reflexes absent.	33	102	1.3	...
30	M	22	12	Mildly depressed, self-absorbed, irritable, suicidal.	Slight congenital chest deformity.	33.3	102	1.8	...
31	F	56	12	Depressed, complaining	Undernourished, tremor hands.	30.6	108	1	...
32	F	31	12	2d attack, fairly quiet and clear, cries.	.....	22.2	105	1.25	...
33	F	33	12	Mild case, clear	.....	21.9	115	1	...
34	F	..	12	Mildly depressed, slightly confused.	Influenza and pulm. tbc. one year ago, arrested.	23.7	105	2	...
35	F	60	12	3d attack, restless, unhappy, agitated.	B. P. 180, reflex exaggerated, tremor extremities, hematuria, blood from rt. ureter, cause undetermined	28.7	94	2.1	...
36	M	27	12	Restless, over-active, confused, depressed, vague hallucinations.	16 lbs. under weight.....	22.6	105	2.1	...
37	M	62	12	Inadequate, retarded, underactive.	Deaf, poor vision left eye, feeble, slow.	28.5	105	.6	...
38	F	52	4	Depressed, quiet, delusional...	.....	27.9	111	.8	...
39	M	53	12	Mildly depressed and apprehensive.	Slight arteriosclerosis, urine has albumin and casts.	32.4	105	1.7	511

MANIC-DEPRESSIVE PSYCHOSIS—(CONTINUED).

DEPRESSED TYPE—(Continued).

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
40	F	28	4	Depressed, weeping, reproachful.	20 lbs. under weight.....	28.2	100	...	478
41	F	34	4	3d attack, restless, suicidal....	Thyroid slightly enlarged..	22.5	107	1.5	616
42	F	28	12	Confused, uncooperative, restless, disturbed.	.....	25	105	1	495
43	M	33	12	Under-active, depressed, apprehensive, hypochrondrical.	Feminine hair distribution..	26.1	96	1.4	461
44	M	33	12	Quiet, depressed	.....	29.3	111	3.8	503
45	F	33	12	Worried, distressed, anxious...	Slight bronchitis	25	108	1.8	503
46	F	26	3	Mildly depressed and worried..	.....	34.3	93	...	...
47	F	27	3	Mildly tense and depressed....	Slight weakness left side face, head injury 3 years ago.	34.3	85	...	...
47	Two mos. later		12	.....	.....	33.3	105	...	...
48	F	46	3	Mildly depressed and apprehensive.	B. P. 170/100	33.3	105	...	...
49	F	29	4	Under-active, unhappy, undertalkative.	Right external strabismus, tongue drawn to right, deep reflexes not obtained.	28.5	91	...	...
50	F	41	12	3d attack, stuporous, tube fed..	Thyroid since 17. Tachycardia, tremor, enlarged thyroid, exophthalmos, V. G. Stellwag and Moebius+	31.5	186	...	...
51	M	60	3½	Depressed, hypochrondrical, irritable.	65 lbs. under weight, double optic atrophy, internal strabismus. B. P. 160/100, K. J. dim., Achilles absent.	33	130	...	...

MANIC-DEPRESSIVE PSYCHOSIS—(CONTINUED).

DEPRESSED TYPE—(Continued).

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
52	M	56	12	3d attack, mildly depressed, slightly confused.	Tremor face and tongue, poor teeth. B. P. 170/95.	28.5	65	1.8	...
53	M	61	12	Mildly depressed, lacks energy	.....	30	119	1.85	...
54	M	33	12	Under-active, introspective, hypochrondrical, suicidal.	.....	23.1	111	.45	445
55	F	59	12	Tense, depressed	Arcus senilis, infected thumb.	29.2	105	1.3	503
56	F	59	4	Discouraged, unhappy, slightly confused.	.....	39.9	166	...	...
57	F	43	12	Slow, self-depreciative, mildly depressed.	Undernourished, hyperthyroidism in 1911.	30.6	111	...	...
58	F	28	12	Depressed, unhappy, suicidal..	.....	26	80	...	...
59	F	56	12	Uneasy, anxious, apprehensive, unhappy.	Recent gall-bladder operation. B. P. 152/80.	37.5	105	...	...
60	M	74	12	Mildly depressed, irritable....	B. P. 152/88, teeth bad.....	35.4	115	1	...
61	M	27	12	Worried, apprehensive, depressive delusions.	.....	30.6	108	2.5	470
62	F	48	12	Mildly depressed, hypochondrical.	Menopause	24.5	100	2	478
63	M	47	12	Worried, discouraged, moderately apprehensive.	Furunculosis	25	85	2.2	461
64	F	61	4	Worried, distressed, apprehensive.	B. P. 170/80	37.8	109	...	...
65	F	44	12	Under-active and mute	.....	40	125	...	...
66	F	44	4	Restless, distressed, somatic delusions.	History of syphilis. Blood and S. F. negative.	38.7	129	1.3	...
67	F	33	4	Well behaved, weeps, vague delusions.	Thyroid slightly enlarged..	26	99	1.8	...

MANIC-DEPRESSIVE PSYCHOSIS—(CONTINUED).

DEPRESSED TYPE—(Continued).

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
68	F	33	4	Restless, hallucinated, somatic delusions.	25 lbs. under weight, skin bronzed.	25.9	133	.4	511
69	F	46	12	Fearful, apprehensive	.....	35.1	97	...	...
70	M	57	12	Agitated, apprehensive, hypochondrical.	.....	35.1	95	1.9	...
				MANIC TYPE.					
71	F	36	2	Mildly elated and overactive...	Thyroid enlarged, tremor fingers, on admission sugar and casts in urine.	33.3	141	...	...
72	F	26	12	2d attack, over-active, restless, over-talkative, mood variable.	.....	31.5	121	...	...
73	F	24	4	Excited, over-active, noisy, destructive.	.....	35.1	87	...	...
74	F	38	4	2d attack, restless, over-active, elated.	.....	28.5	133	...	...
75	F	15	12	Over-active, elated, distractable.	.....	24	80	...	...
76	M	26	12	Mildly elated, slightly over-talkative.	Feminine hair distrib., slight asthma, few hyaline casts.	27.9	105	2.1	...
77	M	27	12	Over-active, elated, excited, hallucinated.	.....	31.5	95	4.5	...
78	M	23	12	Mildly elated and overactive...	Urine contained 0.8% dextrose.	22.2	115	2.1	...
78	6 mos. later readmitted.		12	Mildly elated and overactive...	Urine contained no dextrose.	25.8	94	2.6	486
79	M	37	12	Over-active, elated, critical....	Convalescent pneumonia, urine has albumin, casts and dextrose, diabetes.	35	351	6.6	...

MANIC-DEPRESSIVE PSYCHOSIS—(CONTINUED).

MANIC TYPE—(Continued).

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
80	M	67	12	Mildly elated and over-active, mild delusion of grandeur and persecution.	Urine 4% glucose and casts, diabetes.	34.5	309	1.6	...
81	M	24	12	Mildly over-active, slightly keyed up.	Right pupil irregular, left a little sluggish.	28.6	85	2.1	...
82	F	48	12	Elated, restless, talkative.....	Thyroid palpable, exopthalmus, Von Graefe, Stellwag, Moebius, tremor fingers, pulse 100.	32.4	95	3.8	...
83	M	37	12	Over-active and mildly elated..	12 lbs. under weight.....	33.3	100	2.9	...
84	M	62	12	Overactive, excited, elated, vague ideas of self-reference.	B. P. 125/75	31.5	104	...	...
85	M	20	12	Mildly elated, over-talkative..	.....	30	99	1.1	...
86	F	23	12	Alert, facetious.....	.....	17.6	90	1.27	...
87	F	42	12	Fairly quiet, feelings of electricity, ideas of reference.	.....	22.8	102	1.57	...
88	F	30	12	Mildly over-active, elated and tense.	.....	28.8	105	1.5	...
89	M	32	12	Markedly over-active, over-talkative and excited.	.....	36	105	1.6	...
90	M	42	12	Over-active, elated	15 lbs. under weight.....	26.1	111	.9	...
91	M	40	12	Overactive, playful, mildly elated.	B. P. 140/90	26.6	116	.95	478
92	F	45	4	Over-active over-talkative, elated, irritable.	Weight 207 lbs.....	29.7	129	0.8	461
93	F	28	12	Restless, noisy, delusions of being poisoned.	.....	28.6	108	1.7	523
94	F	37	4	Noisy, some paranoid trends..	.....	31.5	117	2	...

MANIC-DEPRESSIVE PSYCHOSIS—(CONTINUED).

MANIC TYPE—(Continued).

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
95	M	28	12	Restless, irritable, vague, delusions.	.....	31.5	95	3.2	495
96	F	22	12	Mildly over-active, mildly elated.	Skin dry and scaley.....	23	83	2	511
97	F	49	4	Over-active, elated	.....	39.9	100	...	...
98	M	24	4	Over-active, elated	.....	37.8	117	...	...
99	F	36	4	Agitated, restless	B. P. 160, tremor, left ankle clonus.	37.8	100	1	...
100	M	23	12	Mildly over-active euphoric, grandiose.	Fractured skull with decompression 7 mos. ago.....	24.9	74	1.6	...

OTHER TYPES.

101	F	29	4	3d attack, perplexed, anxious..	.....	25.5	93	...	...
102	F	28	12	Worried, apprehensive, depressive delusions.	2d attack, thyroid palpable.	33.6	95	2.4	...
103	F	45	3	Delirious, excited, vague, delusions, apprehensive.	.....	29.9	121	1.8	...
104	F	19	12	Mute, resistive, tube fed, incontinent.	Temp. 102, arrythmia, spin. fluid neg.	25.9	95	1.5	...

INVOLUTION MELANCHOLIA.

INVOLUTION MELANCHOLIA.

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
105	M	63	4	Clouded, delirious	Urine shows albumin, sugar and casts.	33.3	83	...	...
106	M	55	12	Restless, agitated, depressive delusions.	Poorly nourished, bad teeth, hyaline casts and some pus in urine.	35.1	115	2.6	...
107	F	57	12	Agitated, restless, noisy, fairly clear.	B. P. 162/106	28.6	117	1.8	...
108	F	52	12	Complaining, discontented	.....	24.9	97	1.3	495
109	M	61	12	Depressed, apprehensive, ideas of reference.	Arteriosclerosis, B. P. 190/120, few hyaline casts.	35.1	120	3.8	478
110	F	49	12	Depressed, anxious	Deaf right ear.....	26.1	100	2	486
111	F	56	12	Restless, agitated, confused....	B. P. 220, arteriosclerosis, tremor, Romberg.	26.1	87	2.7	470
112	M	53	12	Restless, hypochondrical, somatic delusions.	Recent ulcerative colitis..	31.5	112	5	486

DEMENTIA PRÆCOX.

Simple Type.

113	M	32	12	Languid, listless, indifferent...	.....	30	91	1.6	495
113	One week later.		12	Languid, listless, indifferent...	.....	25	93	1	503

Hebephrenic Type.

114	F	26	12	Deteriorated, delusional	Residuals of old right hemiplegia infantile.	47	102	...	...
115	F	29	12	Childish, somewhat confused, little energy.	Undernourished, thyroid enlarged.	26.1	105	...	...

DEMENTIA PRÆCOX—(Continued).

Catatonic Type.

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
116	M	29	12	Mildly elated and over-active..	Feminine hair distribution..	33.3	103	1.9	...
117	F	24	12	Flippant, facetious, vague hallucinations, untidy.	.....	19.4	80	.43	528
118	F	20	12	Irritable, uncaused laughter, tube fed.	.....	23.1	85	...	...
119	F	29	12	Untidy, over-active, delirious, tube fed.	Weight only 88 lbs	44.4	100	1.9	...

Paranoid Type.

120	M	45	12	Delusion of persecution, rambling speech.	Moderate arteriosclerosis, nephritis.	48	...	...	...
121	F	49	12	Delusional and hallucinated, fairly quiet.	Old thyroidectomy, Goetsch test slightly positive.....	31.5	86	...	...
122	F	66	4	Delusions of persecutions.....	.....	36.3	106	...	...
123	F	41	4	Over-talkative in a depressed way; but no real mood change.	.....	37.5	129	...	...
124	F	29	12	Quiet	.....	33.3	111	1.75	...
125	M	31	12	Delusions of persecutions, auditory hallucinations.	Blood Wassermann inconclusive, possibly has had syphilis; heart irregular and rapid.	30.3	97	3.2	...
126	M	24	12	Quiet, mildly depressed, some confusion and lack of interest.	.....	26.1	111	0.9	...

DEMENTIA PRÆCOX—(CONTINUED).

PARANOID TYPE—(Continued).

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
127	M	38	12	Quiet, deteriorated	.....	28.6	105	2.8	495
128	F	48	12	Delusional and hallucinated....	B. P. 160, undernourished..	25	89	3.3	508
129	M	26	12	Confused, hallucinated, delusional.	.....	42.9	78	1.5	...
130	M	21	12	Delusional and possibly hallucinated.	.....	38.2	83	...	...
131	M	22	12	Hallucinated and delusional...	.....	28.8	116	1.8	...
132	M	43	12	Deteriorated, delusions of persecutions.	Poorly nourished	26.1	98	2.5	495
133	F	41	12	Hallucinated, deteriorated.....	B. P. 158	23	95	1.5	...
134	M	49	12	Delusional and hallucinated...	Arcus senilis	35.4	74	...	...
135	M	20	12	Absorbed, suspicious, perplexed, hallucinated.	Scoliosis, feminine hair distribution.	25.5	97	2	...

PARANOID STATE.

136	F	49	12	Delusions of persecutions.....	.....	31.5	80	...	...
137	F	49	12	Delusions of persecutions.....	.....	32	83	...	...
	Two mos. later.								
138	M	45	12	Retarded, depressed, delusional, hallucinated.	Poorly nourished	45	95	...	...
139	M	28	12	Some deterioration, indifferent.	20 lbs. under weight, fine tremor fingers, B. P. 150/100	32.7	109	1.9	...
140	F	52	12	3d attack, over-active, elated, confused, supicious.	.....	21.4	142	1.4	...

PARANOID STATE—(CONTINUED).

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
141	M	46	12	Slightly discouraged, suspicious	Rt. K. J. and Achilles greater than left.	33.3	99	1.6	...
142	F	50	12	Mildly suspicious, imagines herself pregnant.	Deaf	30	108	1.1	...
143	F	47	4	Delusions of persecution.....	.....	26.4	99	1.5	...
144	F	48	12	Somatic complaints	Arthritis of left shoulder..	24.9	111	.52	511

CONSTITUTIONAL INFERIORITY WITHOUT PSYCHOSIS.

145	F	41	12	Exacting, complaining, restless, moody, hypochondrical.	Rt. pupil Argyl-Robertson, deep reflexes not obtained.	53	108	...	...
146	F	27	12	History of forgery and sex episodes.	.....	32.4	122	...	...
147	M	21	12	History of kleptomania, little sex demand.	6 ft. 1½ in. tall, 328 lbs., femin. hair and skin, penis small, shaves once in two weeks, coarse tremor finger.	38.7 33.3 34	... 81 ...	... ...	... ...
148	F	34	12	Has had tantrums, and attempted suicide.	.....	30.4	78	...	...
149	M	13	12	History of behavior disorders, precocious.	Large head	32.1	77	...	...
150	M	26	12	Introspective, hypochondrical..	Tics	28.6	87	...	...
151	M	21	12	Mildly depressed, homosexual..	.....	24	95	3	...
152	M	56	12	Restless, discontented, depressed.	Pupils a little sluggish, rt. larger than left, weakness rt. internal rectus, occasional hyaline cast.	27.3	91	3.2	470

CONSTITUTIONAL INFERIORITY WITHOUT PHYCHOSIS—(CONTINUED).

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
153	F	19	12	Maladjusted.	Masculine hair distr., spinal curvature, history of chorea.	22.2	102	3.3	539
154	M	18	12	Pathological stealing.	No hair on head or body..	36.3	107	2.1	...
				CONSTITUTIONAL INFERIORITY WITH PSYCHOSIS.					
155	M	14	12	Homosexuality cruelty	Recent rapid growth, 5 ft. 9¼ in., choreiform movements; rare hyaline cast.	27.3	103	4.1	...
156	M	33	12	Hallucinated	.....	27.3	105	2.2	...
157	F	46	4	Depressed, suspicious, alcoholic deterioration, hallucinated.	Very bad teeth, undernourished.	24.9	114	0.7	...
158	M	34	12	Capricious, irritable, restless..	.....	28.5	102	3.2	462
159	M	20	12	Restless, noisy, elated.....	.....	26.6	89	1.9	476
160	M	47	12	Agitated, restless, suspicious...	.....	23.1	111	1.3	486
				PSYCHONEUROSES.					
161	F	23	12	Unhappy, worried compulsions, Binet 11 years.	.....	37.9	117	...	...
162	F	37	12	Introspective, moody, inadequate.	Poorly nourished, lef facial palsy from mastoid.	36	83	...	...

PSYCHONEUROSES—(CONTINUED).

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
163	F	56	4	Converts moods to bodily symptoms.	B. P. 164/100	37.2	103	...	...
163	Six weeks later		12	Converts moods to bodily symptoms.	B. P. 164/100	35.1	100	...	...
164	F	40	4	Hypochondrical and inadequate	Menopause	28.5	142	...	...
165	F	32	12	Indecision, compulsions, tantrums.	Masculine hair distribution.	37.5	95	...	...
166	F	45	4	Obsessions, worries, craves sympathy.	.....	35.4	102	...	...
167	M	16	12	Confused, perplexed, overactive.	Femin. contour, scanty hair	31.8	112	2.9	...
168	F	50	12	Hypochondrical, inadequate, has used paregoric.	Slept none night before...	28	145	4	...
169	M	14	12	Compulsions, irritable, tantrums.	Rapid growth, recently to 5 ft. 10 in.	23	112	2.4	...
170	F	46	12	Somatic delusions	.....	26.1	93	2.3	...
170	One week later			Somatic delusions.	.....	...	91	...	...
171	F	41	12	Indecision, obsessions, lacks energy, depressed.	.....	22.2	95	1	478
172	F	35	12	Depressed, exhausted	B. P. 110/55	24	111	0.5	528
173	F	47	12	Complaining, suspicious, discontented.	Menopause	24.9	98	1.3	528
174	F	22	21	Absorbed, mannerisms	Masculine hair distrib., exophthalmic goitre with operation at 15.	30	95	1.1	495
175	F	65	12	Distressed, tense, hypochondrical.	B. P. 205/100, 26 lbs. under weight.	34.2	91	...	...
176	M	37	12	Mildly depressed, hypochondrical, somatic delusions.	.....	26.1	98	3.8	520
177	M	60	12	Apprehensive, agitated	B. P. 160/110, urine has hyaline casts.	23.1	129	3.2	461

PSYCHONEUROSES—(CONTINUED).

PSYCHONEUROSES—(CONTINUED).

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
178	F	31	3½	Well behaved, vivid dreams....	.....	28.5	87	...	...
179	F	50	12	Depressed, apprehensive, tense, trances.	.....	24	100	1.8	495
				MENTAL DEFICIENCY WITHOUT PSYCHOSIS.					
180	M	27	12	Moron—some paranoid trends.	Tremor fingers, penis small, femin. hair dis., double ankle clonus, greater on right.	25	129	1.6	...
181	M	27	12	Moron—some paranoid trends.	Rt. testicle atrophied, no upper or lower lateral incisors, double ankle clonus, greater on left.	26.1	125	2	...
				MENTAL DEFICIENCY WITH PSYCHOSIS.					
182	M	32	12	Confused, hallucinated	Slight deformity, pupils sluggish, left knee jerk absent.	27.9	95	2.3	...
				ALCOHOL AND DRUG ADDICTION WITHOUT PSYCHOSIS.					
183	M	52	12	Depressed and apprehensive ..	Receiving morphine	33.3	103	...	...
184	M	54	12	Normal (alcohol)	Hyaline casts, pus in urine.	34.2	95	2.5	...
185	F	53	12	Uneasy, apprehensive, suspicious (alcohol).	B. P. 160/100	23	118	1	478

ALCOHOL AND DRUG ADDICTION WITHOUT PSYCHOSIS—(CONTINUED).

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
186	M	42	12	Normal (alcohol and belladonna).	.....	23.1	105	1.6	545
187	F	43	12	Slightly depressed, lacks energy (paregoric).	B. P. 160	28.6	106	1.6	458
188	M	59	12	Apprehensive, worried	Receiving morphine and alcohol.	27.9	129	2	503
				ALCOHOL DELIRIUM.					
189	M	32	4	Restless, apprehensive, vague delusions.	.....	31.8	160	2.2	...
189	Two weeks later		12	Improved	.....	30	105	2.7	...
190	M	25	12	Depressed, apprehensive, vague delusions.	B. P. 95/60	26.1	114	1.4	...
191	M	33	12	(One previous attack) mildly elated.	.....	23.5	123	2.3	478
				ALCOHOLIC DETERIORATION.					
192	M	47	12	Quiet, memory poor	.....	27.2	88.8	...	...
				FATIGUE STATE (NOT INSANE).					
193	F	42	12	Fatigued	.....	27.3	117	1.8	503

BRAIN TUMOR.

BRAIN TUMOR.

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
194	F	55	12	Stuporous	Rt. frontal cystic tumor. W. B. C. 38/600, 83% polys. Renal test 40% in two hours.	54.3	132	2.7	...
194	One month later		4	Stuporous	Spinal fluid neg., abdominals absent. Double Babinski. (Died.)	46.5	108	...	...

PSYCHOSIS WITH ENDOCRINE DISORDER.

195	F	32	4	Childish, suspicious, possibly hallucinated.	4 ft. 9½ in., 148 lbs., small hands and feet, skin coarse and oily, masculine hair, tapering fingers.	33.3	90.9		
195	Two weeks later		12	Childish, suspicious, possibly hallucinated.	4 ft. 9½ in., 148 lbs., small hands and feet, skin coarse and oily, masculine hair, tapering fingers.	31.5	100	...	...
196	M	32	12	Confused, resistive	Feminine body contour and hair distrib., hands and feet small, penis and testicles small. X-ray shows small sella turica and pineal shadow.	21.4	93	...	...

TRAUMATIC PSYCHOSES.

197	F	58	12	Semi-delirious, mood variable..	Recent fall with fracture and bruises.	32.4	125	.6	429

PSYCHOSIS WITH CARDIO-RENAL DISEASE.

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
198	M	53	12	Confused, excited, irritable...	B. P. 178/126, heart and liver enlarged, urine shows albumin, sugar and casts.	43	213	...	...
198	15 months later		12	Confused, excited, irritable....	No sugar in urine. Dieted.	48	83	4.4	...
199	F	58	12	Hot flushes, nervousness	B. P. 195/100, shows albumin, dye tests 27% in two hours.	51.9	...	...	...
200	M	55	12	Confused, irritable	Arteriosclerosis. B. P. 158/98, urine has albumin and casts, marked pyorrhea.	43.4	117	...	...
201	M	76	12	Confused, disoriented, recent memory poor.	B. P. 188/88, pupils sluggish, hyaline casts.	44.4	90	1.4	...
202	M	50	4	Agitated, apprehensive, somatic delusions.	Arteriosclerosis. B. P. 190/105, heart and liver enlarged, urine has albumin and casts.	42	125	...	...
202	Four mos. later		12	Agitated, apprehensive, somatic delusions.	Arteriosclerosis. B. P. 190/105, heart and liver enlarged, urine has albumin and casts.	24	146	2	...
203	M	55	12	Worried, apprehensive, confused.	B. P. 105/70. Arteriosclerosis, feminine hair distr., 33 lbs. underweight.	31.6	125	2	...

INFECTIVE EXHAUSTIVE PSYCHOSIS.

204	F	45	3	Dull, retarded, confused, vague hallucinations.	Chronic nose and ears, slight irregularity pupils, tremor tongue. B. P. 150/90.	31.5	125	...	...

INFECTIVE EXHAUSTIVE PSYCHOSIS—(CONTINUED).

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
205	F	21	12	Mood variable, vague hallucinations and delusions.	.....	35.7	100	0.9	...
206	F	21	4	Confused, retarded	Rare hyaline and granular cast.	40	100	...	...
207	F	20	4	Uneasy, restless, confused.....	Thyroid slightly enlarged..	28.8	111	...	...
208	M	37	12	Tense, restless, depressed.....	Four apical abscesses, atrophic rhinitis.	33.3	111	2.7	...
208	Six mos. later		12	Apprehensive	Teeth all removed.....	30	116	1.7	503
209	F	22	4	Restless, confused, slightly apprehensive.	B. P. 155/105. Thyroid slightly enlarged. One granular cast.	33.3	96	4	...
210	M	23	12	Stuporous, untidy, mute	.....	32.4	89	1.8	...
211	F	32	12	Confused, suicidal, worried, hallucinated.	.....	26.1	93	1.4	...
212	F	54	12	Restless, confused, apprehensive.	B. P. 170	36.3	111	2.1	...
213	F	19	12	Overactive, noisy, clouded, excited.	Temp. 100-6, thyroid palpable.	26.6	111	1.4	503
214	F	37	4	Essentially recovered	B. P. 96/64	38.1	110	...	...
215	F	54	4	Dazed, confused	Weight 81.5 lbs	34.2	125	1.2	...
216	F	63	12	Delirious	B. P. 190/120	33.6	105	6.8	503
217	M	34	12	Semi-delirious, has been drinking.	Weak	21.4	125	2	503
218	M	37	4	Incoherent, clouded, resistive..	Temp. 100	45.9	100	4	...
219	F	37	12	Restless, confused, apprehensive.	.....	34.2	125	1.5	...
220	M	35	12	Retarded, depressed, hallucinated.	.....	25.5	104	1.8	...

SENILE DEMENTIA.

Case No.	Sex.	Age.	Hours of fast.	Mental state.	Physical state.	N.P.N.	D.	U. A.	Cl.
221	F	68	12	Clouded, restless, apprehensive, poor memory.	Marked pyorrhea	28.6	153	.66	...
222	F	76	12	Clouded, deteriorated, restless.	Marked senile change.....	24.6	111	1.6	...
223	M	56	12	Mildly depressed, possibly hallucinated.	Nystagmus, tremor, temp. 100.2, few rales.	34.5	87	...	...

GENERAL PARALYSIS.

224	M	50	4	Euphoric, quiet, markedly deteriorated.	Urine 5% sugar. Typical paretic findings	54.3	234	...	...
225	M	44	2½	Markedly deteriorated and confused.	Typical paretic findings	39.9	117	.95	...
226	M	46	12	Excited, over-active, euphoric, grandiose.	Typical paretic findings....	48	309	2.72	...
226	Two mos. later		12	Excited, over-active, euphoric, grandiose.	Typical paretic findings....	27.2	142	...	...
227	M	49	12	Euphoric, grandiose, deteriorated.	Typical paretic findings....	33	133	4	...
228	M	40	12	Elated, euphoric, grandiose, over-active.	Typical paretic findings....	31.5	95	1.8	461
229	M	37	12	Confused, depressed	Typical paretic findings....	30	135	4.1	461

DISCUSSION.

Seventy cases of manic-depressive psychoses of the depressed type were examined. The findings are tabulated:

	Minimum.	Maximum.	Average.	No. of examinations.
N. P. N.	21	51	31.9	77
Dextrose	66	480	116.5	77
Dextrose*	66	186	110.6	75
Uric acid	0.4	3.8	1.6	44
Chlorides	445	616	494	13

* Leaving out the two examinations on Case No. 1, a diabetic.

The average findings are, therefore, well within normal limits. Of the seventy-seven non-protein nitrogens, seventeen were above normal, but six were less than 38 mgm. and of the remaining eleven, one was in a case having a blood pressure of 228, and two were in cases of nephritis. Only three were above 40 mgm.

Leaving out a case of diabetes, of the seventy-five dextrose examinations, fifteen were above normal. Four were below 130 mgm. and seven were below 140 mgm. The other four were 155, 166, 181 and 186 mgm. There was apparently no relation between the mental state and the dextrose finding. Many tense, restless cases had low findings as cases No. 5 and 8.

In cases No. 17 and 18 there was question of patient's having obtained food and the second examinations revealed perfectly normal findings.

The uric acid findings from forty cases were normal, one case being above normal, 3.8 mgm., and three below normal, 0.4, 0.45, and 0.6 mgm.

The thirteen chloride findings were all normal except one which was 616 mgm.

Thirty cases of manic-depressive psychoses of the excited type were examined. The findings are tabulated:

	Minimum.	Maximum.	Average.	No. of examinations.
N. P. N.	17.6	39.9	28.3	31
Dextrose	74	351	118	31
Dextrose*	74	133	103.6	29
Uric acid	0.8	6.6	2.14	23
Chlorides	461	511	492	6

* Omitting two cases of diabetes.

The average findings were well within normal limits. The non-protein nitrogen and dextrose averaged slightly below that found in the depressed type. The uric acid was higher and the chlorides were essentially the same.

Only three non-protein nitrogens were above normal, and these were all below 40 mgm., while three were below normal. Omitting the two diabetic cases, only four cases had high dextrose findings and these were: 121, 129, 131 and 141 mgm., respectively. There were three uric acids above normal, one (6.6 mgm.), in a case of nephritis and diabetes. The chlorides were all normal.

Four cases of other types of manic-depressive psychoses showed no abnormal findings. One dextrose was 121 mgm.

Eight cases of involution melancholia were examined. The findings are tabulated:

	Minimum.	Maximum.	Average.	No. of examinations.
N. P. N.	24.9	35.1	30.1	8
Dextrose	83	120	104	8
Uric acid	1.3	5	2.7	7
Chlorides	470	495	483	5

No abnormal findings were observed except that one uric acid was 5 mgm. and one was 3.8 mgm.

Twenty-four cases of dementia præcox were examined. The findings are tabulated.

	Minimum.	Maximum.	Average.	No. of examinations.
N. P. N.	19.4	48	31.8	24
Dextrose	74	129	97	23
Uric acid	0.43	3.3	1.86	15
Chlorides	495	528	504	6

The average findings were well within normal limits.

Five non-protein nitrogens were above normal. One was only 37.5 mgm. The other four ranged from 42.9 to 48 mgm., the latter having a nephritis at the time. One non-protein nitrogen was 19.4 mgm.

The sugar findings were remarkably normal, only one being above normal, 129 mgm., and one below, 74 mgm.

The uric acids were all normal except one low one, 0.43 mgm.

The chlorides were all normal.

Eight cases of paranoid state were examined. The findings are tabulated:

	Minimum.	Maximum.	Average.	No. of examinations.
N. P. N.	21.4	45	30.8	9
Dextrose	83	142	103	9
Uric acid	0.52	1.9	1.33	6
Chlorides	511	511	511	1

The average findings, were well within normal limits.

One non-protein nitrogen was high, 45 mgm., and one low, 21.4 mgm.

One dextrose was high, 142 mgm.

One chloride was normal.

Nine cases of constitutional inferiority without psychosis were examined. The findings are tabulated:

	Minimum.	Maximum.	Average.	No. of examinations.
N. P. N.	22.2	53	32.7	12
Dextrose	78	122	94.8	10
Uric acid	2.1	3.3	2.9	4
Chloride	470	539	505	2

The average findings were well within normal limits.

Six cases of constitutional inferiority with psychosis were examined. All findings were normal, except that one uric acid was 4.1 mgm.

Nineteen cases of psychoneurosis were examined. The findings are tabulated:

	Minimum.	Maximum.	Average.	No. of examinations.
N. P. N.	22.2	37.9	29.7	20
Dextrose	83	145	104.7	21
Uric acid	0.5	4	2.3	11
Chlorides	461	528	501	6

The average findings were well within normal limits.

The non-protein nitrogen findings were all normal, three cases being a fraction of a milligram above normal standard.

Three dextrose findings were high, being 129, 142 and 145 mgm., respectively.

Two uric acids were high, 3.8 and 4 mgm., and one was low, 0.5 mgm.

Two chlorides were a little high, both being 528 mgm.

Two cases of mental deficiency without psychosis (twins) and one case of mental deficiency with psychosis gave normal findings.

Six cases of drug addiction without psychosis gave normal findings, except that one dextrose was 129 mgm., and one chloride, 545 mgm.

Three cases of alcoholic delirium showed two dextrose findings high, 123 mgm. and 160 mgm. Other findings were normal.

One case of alcoholic deterioration showed normal findings.

One case of fatigue state (not insane) showed normal findings.

One case of brain tumor showed high non-protein nitrogen and dextrose, 54 mgm. and 132 mgm., respectively. These findings decreased under eliminative treatment.

Two cases of psychosis with endocrine disorder showed normal findings.

One case of traumatic psychosis showed dextrose slightly increased, 125 mgm., and a low uric acid, 0.6 mgm.

Six cases of psychosis with cardio-renal disease were examined. The findings are tabulated:

	Minimum.	Maximum.	Average.	No. of examinations.
N. P. N.	24	51	41	8
Dextrose	90	213	128.4	7
Uric acid	1.4	4.4	2.45	4

The average findings for non-protein nitrogen and dextrose were definitely increased above normal.

Only one case, on admission had a normal non-protein nitrogen and only two had normal dextrose findings.

Eighteen cases of infective exhaustive psychosis were examined. The findings are tabulated.

	Minimum.	Maximum.	Average.	No. of examinations.
N. P. N.	21.4	45.9	32.6	18
Dextrose	89	125	108.7	18
Uric acid	0.9	6.8	2.4	14
Chlorides	503	503	503	4

The average findings were within normal limits.

Three non-protein nitrogens were above normal, one case with fever had 45.9 mgm., one case with nephritis had 40. mgm., and third case had 38.1 mgm.

Four cases had dextrose increased to 125 mgm.

Three uric acids were above normal, two were 4 mgm. and one was 6.8 mgm.

Three cases of senile dementia were examined.

The findings were normal except one dextrose was 153 mgm.

Six cases of general paralysis were examined. The findings are tabulated:

	Minimum.	Maximum.	Average.	No. of examinations.
N. P. N.	27.2	54.3	37.7	7
Dextrose	95	309	166.4	7
Uric acid	0.95	4.1	2.71	5
Chlorides	461	461	461	2

The non-protein nitrogen and dextrose averages were above normal, but there was great variability in individual cases.

AVERAGE IN VARIOUS MENTAL DISEASES.

	N. P. N.	Dextrose.	Uric acid.	Chlor.
Manic-depressive depression	31.9	110.6	1.61	494
Manic-depressive excitement	28.3	103.6	2.14	492
Involutional melancholia	30.1	104	2.7	483
Dementia præcox	31.8	97	1.86	504
Paranoid state	30.8	103	1.33	511
Constitutional inferiority without psychosis	32.7	94.8	2.9	505
Psychoneurosis	29.7	104.7	2.3	501
Psychosis with cardio-renal disease	41	128.4	2.45	...
Infective exhaustive psychosis	32.6	108.7	2.4	503
General paralysis	37.7	166.4	2.71	461
Senile dementia	29.2	117*	1.1	...

* Only three cases examined, two were normal. Average is probably too high.

CONCLUSIONS.

Two hundred and twenty-nine cases of mental disease were examined. The average findings for blood non-protein nitrogen, dextrose, uric acid and chlorides were found to be normal for all types of mental disease except psychosis with cardio-renal disease and general paralysis, both of which showed increased findings for non-protein nitrogen and dextrose.

I wish to express my thanks to the other members of the staff for the use of their case records.

Credit is due Miss Marguerite Jewell, laboratory technician, for a considerable number of the blood analysis.

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BLOOD FRAGILITY STUDIES IN CERTAIN PSYCHOPATHIC STATES.*

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The question of erythrocyte fragility in psychopathic conditions suggested itself as of peculiar interest, particularly in view of the apparent occurrence of certain other blood changes, in such states, notably in dementia præcox and manic-depressive insanity—thus decreased bleeding time and increased platelet count (Uyematsu [1]), corpuscular "crises" (Lundwall [2]), increased white cell count with relative diminution in polymorphonuclear elements (Heileman,[3] Sandri [3]), increased eosinophiles (Dide and Chevais [3]), and increased erythrocyte size with annular disposition of the hæmoglobin (Pighini and Paoli [3]), in dementia præcox; and increased hæmoglobin content with increased red and white cell counts (Fischer [3]), increased mononuclear white cells (Parhon and Urechie [3]), and decreased erythrocyte resistance to the blood sera of other individuals (Alberti [3]), in manic-depressive insanity. A certain added interest is lent this general question through indication, in dementia præcox and manic-depressive insanity, of the definite occurrence of fundamental metabolic changes, as reported by numerous workers and recently emphasized through blood sugar studies by Kooy,[4] Lorenz,[5] and Raphael and Parsons,[6] and, additionally, through histopathologic studies, by Mott,[7] in dementia præcox, suggesting the strong probability, in this disorder, of underlying systemic hypo-oxidation.

The only finding available in the literature specifically as regards erythrocyte resistance, in psychiatric disorder, to various saline strengths, as here employed, is the report of one case of general paresis, by Butler,[8] in which no apparent change was determinable.

* From the Kalamazoo State Hospital, Kalamazoo, Michigan.

PROCEDURE.

In this study, carried on through the spring of 1921, there was utilized a series (Table 1) comprising 10 normal controls and 228 psychopathic cases of both sexes, including dementia præcox, manic-depressive insanity, psychoneurosis, general paralysis, epilepsy and mental deficiency, all of which as far as could be detected by gross examination were apparently negative, clinically, from other standpoints. During this period, certain subjects of the paretic group, as indicated in Table 8, were under specific treatment consisting essentially of intravenous neo-arsphemamine and intramuscular mercuric salicylate.

The technic employed was that suggested by Greenthal and O'Donnell,[9] in improvement over the original erythrocyte fragility technic as devised by Butler and which, in quotation, may be described specifically as follows:

> Three cubic centimeters of blood is withdrawn with a dry Luer syringe into a centrifuge tube containing 3 c. c. of a 0.85 per cent solution of sodium chlorid and sodium citrate, respectively. The blood is centrifuged until 3 c. c. of clear supernatant fluid can be withdrawn and discarded. The volume of the red blood cells is now in the same proportion as in the original blood. The blood cells and citrated plasma are well mixed and 0.1 c. c. of blood is added to each of a series of 10 test tubes containing 1 c. c. of saline solution, beginning at 0.5 per cent and diminishing in gradations of 0.025 per cent down to 0.275 per cent. After standing one hour, the test tubes are gently centrifugated † and the point of beginning and complete hemolysis is noted. Using this method, normal bloods show a beginning hemolysis at 0.425 per cent and complete hemolysis at 0.325 per cent. About 5 per cent of normal bloods show beginning hemolysis at 0.4 per cent.

A slight modification was made in the Greenthal-O'Donnell procedure as regards the reading of the tubes, thus instead of recording the hemolysis present, descriptively, as "beginning hemolysis" "complete hemolysis" etc., the readings were recorded numerically (Table 2), thereby rendering comparison much more clear and readily apparent and permitting tabulation in terms of formulæ for the 10-tube series, thus 0001234555.

† Instead being centrifuged, our tubes were allowed to stand-over two hours, an alternative indicated by the authors (personal communication) as equally satisfactory.

The findings obtained were recorded, with other additional descriptive data, in tabular form under specific group heads as indicated in Tables 3 through 11.

TABLE 1.

CASES.

Type.	No.
Normals	10
Dementia præcox	95
Manic-depressive (manic)	21
Manic-depressive (depressed)	14
General paresis	48
Epileptic	15
Feeble-minded	27
Psychoneurosis	8
Total (psychopathic)	228

TABLE 2.

Numerical Hemolysis Key.

0—No hemolysis.
1—Faint trace of hemolysis.
2—Trace of hemolysis.
3—Partial hemolysis.
4—Almost complete hemolysis.
5—Complete hemolysis

TABLE 3.

NORMALS.

Case.	Age.	Sex.	Blood Fragility.
1—T. R.	29	Male.	0001234555
2—C. C.	32	"	0001234555
3—M. C.	20	"	0001234555
4—C. M.	25	"	0001234455
5—J. D.	52	"	0001134555
6—A. C.	23	"	0001224555
7—C. S.	24	"	0001233555
8—L. C.	28	Female.	0001234455
9—B. T.	26	"	0000124455
10—P. W.	23	"	0001234555

TABLE 4.

Dementia Præcox.

MALE.

Case.	No.	Age.	Type.	Dur.	Blood Fragility.
1—C. S.	18070	29	Paranoid.	1 yr.	0112345555
2—G. T.	7707	56	"	22+ yrs.	0012345555
3—J. R.	18474	33	"	4 mos.	0012235555
4—T. S.	18186	63	"	6+ yrs.	0012345555
5—S. T.	15457	62	"	4+ yrs.	0001123455
6—C. D.	13780	33	"	9+ yrs.	0111234555
7—C. M.	17508	39	"	8+ yrs.	0011234555
8—C. E.	13784	29	"	12+ yrs.	0011234555
9—L. C.	14100	35	"	10+ yrs.	0011334455
10—E. J.	11821	36	"	13+ yrs.	0001123455
11—J. B.	14455	36	"	9+ yrs.	0001245555
12—W. P.	18427	49	"	15+ yrs.	0001344555
13—B. K.	18130	27	"	2+ yrs.	0001244555
14—F. C.	17925	27	"	3+ yrs.	0001234555
15—C. C.	18389	33	"	11+ mos.	0001245555
16—C. E.	17580	24	"	5+ yrs.	0011245555
17—C. P.	18540	37	"	3 mos.	0001134555
18—A. W.	13295	35	Hebephrenic.	15+ yrs.	0012344555
19—J. M.	18266	25	"	5+ yrs.	0001234555
20—L. H.	18374	19	"	3+ yrs.	0001234555
21—H. S.	16702	28	"	3+ yrs.	0001234555
22—J. F.	18408	48	"	5+ mos.	0001235555
23—F. W.	18501	46	"	3+ mos.	0001234555
24—M. C.	18310	44	"	6+ mos.	0001234555
25—W. S.	13813	27	"	29+ yrs.	0011124455
26—A. N.	12322	31	"	11+ yrs.	0011234555
27—P. K.	15681	31	"	13+ yrs.	0112355555
28—A. M.	16086	31	"	3+ yrs.	0001245555
29—E. L. H.	12076	30	"	30 yrs.	0011344455
30—F. G.	10379	36	"	14+ yrs.	0011245555
31—E. F.	6497	59	"	32+ yrs.	0011245555
32—J. V.	10006	49	"	37+ yrs.	0011244555
33—L. H.	4164	64	"	40+ yrs.	0001124555
34—J. J.	6718	50	"	50+ yrs.	0011344555
35—J. G.	6776	45	"	27+ yrs.	0001234555
36—A. G.	10786	35	"	14+ yrs.	0111244555
37—J. K.	3148	63	"	40+ yrs.	0001235555
38—E. W.	15656	32	"	7+ yrs.	0011245555
39—C. G.	8918	46	"	18+ yrs.	0001134455
40—J. M.	7796	66	"	21+ yrs.	0001234555

Case.	No.	Age.	Type.	Dur.	Blood Fragility.
41—M. B.	2446	67	Hebephrenic.	34+ yrs.	0001235555
42—A. M.	16086	30	"	3+ yrs.	0012345555
43—W. H. M.	7036	43	"	26+ yrs.	0001235555
44—F. S.	9309	43	"	41+ yrs.	0012345555
45—V. N.	14996	33	"	5+ yrs.	0001245555
46—H. B.	2816	81	"	43+ yrs.	0001234555
47—J. M.	16785	28	"	2+ yrs.	0001345555
48—F. C.	3253	58	"	44+ yrs.	0001245555
49—M. C.	11270	39	"	10+ yrs.	0000114555
50—D. D.	2046	75	"	45+ yrs.	0001344555
51—W. D.	18398	28	"	5+ yrs.	0001134555
52—M. W.	18049	30	"	7+ yrs.	0000124555
53—H. B.	18089	22	"	2+ yrs.	0000123555
54—E. C.	18513	19	"	4 mos.	0000113555
55—R. B.	18084	23	"	1+ yrs.	0000124555
56—M. H.	18200	20	Catatonic.	1+ yrs.	0000124555
57—B. W.	5721	56	"	34+ yrs.	0012244555
58—C. V.	11460	40	"	12+ yrs.	0011245555
59—D. J.	12013	55	"	29+ yrs.	0112344555
60—G. B.	3268	60	"	40+ yrs.	0011235555
61—P. K.	5301	64	"	34+ yrs.	0011355555
62—G. S.	10617	37	"	22+ yrs.	0001245555
63—A. K.	9524	53	"	16+ yrs.	0001355555
64—S. D.	10740	40	"	16+ yrs.	0001345555
65—A. H.	17667	27	"	1+ yrs.	0000124555
66—M. H.	18200	20	"	1+ yrs.	0001124555
67—E. B. T.	18508	20	"	3+ mos.	0001124555
68—Z. F. A.	17686	35	Simplex.	14+ yrs.	0112345555

TABLE 5.

Dementia Præcox.

FEMALE.

Case.	No.	Age.	Type.	Dur.	Blood Fragility.
1—L. O.	18499	25	Hebephrenic.	2 yrs.	0001245555
2—F. H.	18569	38	"	7 yrs.	0011345555
3—R. A.	17345	50	"	8+ yrs.	0112345555
4—M. B.	12265	41	"	31+ yrs.	0001134555
5—O. B.	14661	25	"	6+ yrs.	0011234555
6—C. B.	17564	34	"	5+ yrs.	0011245555
7—H. B.	12997	30	"	11+ yrs.	0001234555
8—A. B.	9705	37	"	21 yrs.	0001235555
9—H. B.	13396	30	"	11+ yrs.	0000124555

Case.	No.	Age.	Type.	Dur.	Blood Fragility.
10—M. C.	8817	42	Hebephrenic.	18+ yrs.	0001234444
11—M. C.	8867	49	"	18+ yrs.	0001234555
12—O. D.	14618	25	"	25 yrs.	0001234555
13—A. D.	15490	34	"	19+ yrs.	0000124455
14—L. D.	13116	25	"	10 yrs.	0001235555
15—M. C.	13427	40	"	8+ yrs.	0001124555
16—M. B.	15449	27	Catatonic.	6+ yrs.	0012355555
17—J. W.	18369	38	Paranoid.	9+ yrs.	0001124555
18—M. B.	17848	46	"	22+ yrs.	0001235555
19—I. A.	13618	44	"	7+ yrs.	0112445555
20—I. B.	14691	49	"	17+ yrs.	0001123455
21—A. L.	16833	41	"	2+ yrs.	0001224555
22—L. B.	16849	50	"	9+ yrs.	0001245555
23—M. B.	18201	40	"	17+ yrs.	0123555555
24—R. B.	15451	47	"	15+ yrs.	0001124455
25—E. C.	12838	50	"	26+ yrs.	0001124555
26—M. C.	15402	38	"	11+ yrs.	0000013455
27—M. C.	17503	22	"	1+ yrs.	0001345555

TABLE 6.

Manic-Depressive Psychosis.

Manic Phase.

Case.	No.	Age.	Sex.	Dur.	Attacks.	Blood Fragility.
1—G. H. O.	18502	63	M.	8+ mos.	1	0001234555
2—L. R.	18405	57	"	8+ mos.	1	0000022355
3—J. C.	18461	60	"	4+ mos.	1	0000123445
4—F. G.	18302	25	"	11+ mos.	1	0001244555
5—C. C.	13301	60	"	19+ mos.	1	0001234555
7—P. F.	17615	34	"	8+ yrs.	1	0001124555
8—L. W.	16177	36	"	3+ yrs.	1	0011235555
9—B. S.	17407	56	"	2+ yrs.	1	0001234555
10—J. C.	17459	49	"	1+ yrs.	3	0011234555
11—F. B.	18064	40	"	1+ yrs.	1	0001234555
12—C. M.	17617	61	"	1+ yrs.	5	0001123445
13—F. J.	17896	49	"	3+ yrs.	1	0001124455
14—E. B.	16633	65	"	3+ yrs.	1	0001124555
15—C. A.	18307	37	"	7+ mos.	2	0000124555
16—F. W.	18246	60	"	11+ mos.	1	0001123445
17—N. H.	18027	40	F.	1+ yrs.	1	0001244555
18—E. J.	18529	26	"	5 mos.	1	0011345555
19—J. C.	11480	81	"	12+ yrs.	3	0111234555
20—C. B.	18482	61	"	9+ mos.	1	0011235555
21—E. R.	18630	47	"	7+ yrs.	1	0001234555

TABLE 7.

Manic-Depressive Psychosis.

Depressed Phase.

Case.	No.	Age.	Sex.	Dur.	Attacks.	Blood Fragility.
1—W. C.	14505	65	M.	6+ yrs.	1	0001245555
2—J. B. W.	18210	22	"	11+ mos.	2	0001224555
3—R. P.	14121	63	"	8+ yrs.	1	0000123455
4—G. K.	19139	34	"	1+ yrs.	2	0000122455
5—R. L.	18348	26	"	6+ mos.	1	0001125555
6—F. F.	16966	64	"	3+ yrs.	1	0001134555
7—J. V.	18550	48	"	4+ yrs.	1	0001234455
8—J. H.	18145	59	"	1+ yrs.	1	0001234555
9—W. R.	18043	59	"	15+ yrs.	1	0001244555
10—E. W.	18522	55	F.	2+ yrs.	1	0112345555
11—O. C.	18484	34	"	6+ mos.	1	0001235555
12—A. B.	18446	59	"	6+ mos.	1	0001235555
13—E. S.	18543	32	"	8+ mos.	1	0011224555
14—J. H.	18145	59	M.	1+ yrs.	1	0001234555

TABLE 8.

General Paresis.

Case.	No.	Age.	Sex.	Dur.	Date Last Treat.	Blood Fragility.
1—H. G.	16802	44	M.	3 yrs.	8- 4-18	0001364500
2—G. B.	18328	48	"	Unknown.	2-18-21	0011345555
3—W. B. D.	18240	42	"	1+ yrs.	11- 9-20	0011435555
4—A. B.	17431	36	"	2 yrs.	9-29-19	0001134455
5—R. B.	18542	17	"	5 mos.	5-27-21	0011245555
6—G. T.	18456	32	"	4+ yrs.	4- 1-21	0001235555
7—G. W. A.	18405	54	"	15 yrs.	1-10-21	0001245555
8—F. M.	18510	66	"	1+ yrs.	5- 6-21	0001234445
9—J. F. M.	18464	29	"	1 yr.	5- 4-21	0001134555
10—D. I.	18226	61	"	24 yrs.	12-24-20	0001234555
11—P. S.	13508	47	"	8 yrs.	8- 6-16	0001234555
12—W. W.	15729	27	"	Unknown.	5-27-21	0001234555
13—J. S.	18351	45	"	9 mos.	2-28-21	0011234555
14—C. B.	18445	42	"	5+ yrs.	4-21-21	0001134555
15—W. G.	18197	31	"	3+ yrs.	1-17-21	0001134555
16—H. B. C.	18555	43	"	1+ yrs.	5-27-21	0112345555
17—T. C.	18262	64	"	1+ yrs.	12-24-21	0001245555
18—W. B.	18324	59	"	Unknown.	2- 4-21	0011235555
19—F. E.	18432	45	"	1+ yrs.	3-11-21	0000112455
20—B. D.	15709	60	"	5 yrs.	11- 5-17	0001234555
21—C. F. C.	11244	45	"	13 yrs.	No acct.	0111455555
22—G. G.	18422	27	"	8 mos.	11- 5-17	0001234555

Case.	No.	Age.	Sex.	Dur.	Date Last Treat.	Blood Fragility.
23—A. M.	16968	53	M.	3 yrs.	No acct.	0011134555
24—F. J.	17033	67	"	3 yrs.	No acct.	0001134555
25—J. D.	17370	41	"	2+ yrs.	9- 9-19	0011345555
26—F. B.	13771	51	"	9+ yrs.	No acct.	0001134555
27—W. E. H.	17140	60	"	5+ yrs.	1-11-19	0011345555
28—J. P.	15448	67	"	6+ yrs.	6- 1-17	0001134555
29—J. S.	18014	51	"	1+ yrs.	5-27-21	0001235555
30—A. W.	18309	47	"	10 mos.	1-28-21	0001345555
31—M. M.	17707	34	"	1+ yrs.	1-30-21	0001123455
32—M. J. S.	18361	35	"	2+ yrs.	2-28-21	0001234555
33—J. W.	18234	55	"	1+ yrs.	11-18-20	0001345555
34—H. O.	15131	33	"	4+ yrs.	6- 1-17	0000112355
35—G. T.	14599	55	"	6+ yrs.	No acct.	0011245555
36—C. R.	15434	48	"	14 yrs.	11-18-17	0001234555
37—D. M.	16418	66	"	4 yrs.	No acct.	0001123455
38—C. H.	14705	64	"	7+ yrs.	9-21-17	0001234555
39—W. M.	17605	36	"	3+ yrs.	11-18-20	0001234555
40—F. S.	18538	37	"	6 mos.	5-27-21	0011134555
41—F. W.	18538	37	"	7 mos.	5-20-21	0001234555
42—L. O.	18414	34	"	1+ yrs.	5-27-21	0011345555
43—J. R.	18523	34	"	1+ yrs.	6-16-21	0011345555
44—H. K.	18504	68	"	4 yrs.	5-27-21	0011344555
45—R. B.	18542	17	"	5 mos.	5-27-21	0001344555
46—F. F.	18291	46	F.	Unknown.	11-29-20	0111344555
47—A. V.	17685	42	"	Unknown.	12-15-19	0112255555
48—M. S.	18404	48	"	Unknown.	5-12-21	0011234555

TABLE 9.

EPILEPSY.

Case.	No.	Sex.	Age.	Blood Fragility.
1—J. S.	15433	M.	59	0012345555
2—J. L.	17043	"	42	0001344555
3—A. W.	10738	F.	45	0011245555
4—F. S.	14407	"	49	0001234555
5—M. R. W.	18216	"	22	0001245555
6—M. K.	16285	"	16	0012455555
7—H. E.	13469	"	37	0011255555
8—A. O.	16876	"	29	0011355555
9—E. S.	18110	"	43	0001234555
10—M. K.	4558	"	49	0001123555
11—L. W.	10534	"	46	0001235555
12—N. W.	17037	"	33	0000123555
13—E. P.	16562	"	54	0001135555
14—M. R.	12020	"	49	0000124555
15—G. C.	16366	"	27	0011455555

TABLE 10.

Mentally Defective.

Case.	No.	Age.	Sex.	Blood Fragility.
1—F. B.	6892	57	M.	0012345555
2—J. V.	18416	21	"	0000123455
3—B. C.	8201	44	"	0000113455
4—C. B.	16593	55	"	0011235555
5—E. B.	16171	25	"	0001123455
6—C. B.	17988	68	"	0001123455
7—A. C.	12951	41	"	0001123445
8—I. C.	18326	52	"	0000123455
9—E. E.	17541	25	"	0001234555
10—R. H.	18438	26	"	0001123455
11—K. S.	18007	20	"	0001135555
12—W. K.	17258	26	"	0001234555
13—S. B.	17656	15	"	0001123555
14—H. C.	14286	26	"	0001134555
15—R. D.	17098	29	"	0001124555
16—C. B.	18170	31	"	0001134455
17—E. D.	18203	23	"	0000112255
18—M. B.	17411	24	F.	0001234555
19—L. B.	12124	27	"	0011244555
20—I. B.	7857	51	"	0112345555
21—C. B.	13392	58	"	0001134555
22—O. B.	13554	57	"	0001235555
23—E. C.	15658	31	"	0001234455
24—A. C.	16753	46	"	0112444555
25—M. B.	14053	28	"	0001445555
26—N. C.	16399	24	"	0001234555
27—E. C.	7303	40	"	0001134555

TABLE 11.

Psychoneurosis.

Case.	No.	Age.	Sex.	Blood Fragility.
1—H. R.	18113	57	M.	0012345555
2—F. M. H.	12656	42	"	0000012455
3—W. F.	17479	21	"	0001234555
4—C. H.	14118	27	"	0000123455
5—A. B.	18401	21	"	0001345555
6—H. T.	18164	46	"	0001234555
7—M. L. W.	17210	43	"	0001345555
8—A. B.	18576	43	"	0001124555

RESULTS.

The formulæ determined in the case of the control subjects seem to agree strikingly and to warrant the general normal formula of 0001234555, in fundamental agreement with the findings reported by both Greenthal and O'Donnell, and Butler.

Analysis of the results as tabulated, indicates definite deviation from the fragility norm in each of the psychotic groups, slight to moderate in degree and in both directions, thus in the dementia præcox group this deviation may be determined in 47 cases or 50.6%, 37.8% showing apparent decrease in red cell resistance and 12.6% an increase, affecting, seemingly, in the case of the latter, younger individuals in whom the psychosis was of but short duration. No characteristic change, however, was noted as regards the specific types of dementia præcox. The manic depressive cases showed, in the depressed phase, a total deviation of 28.4% among 14 cases, equally divided in point of positive and negative variation, and in the manic phase, a total deviation of 38% among 21 cases, 23.8% showing increased fragility and 14.2% showing a decrease. In general paralysis a total change of 40.7% occurred, 36.7% showing a tendency toward increased fragility with, seemingly, no definite relationship to recency of specific treatment. The feeble-minded group showed a deviation in 33.3% of 27 cases, 18.5% evidencing an increase and 14.8% a decrease. Of a series of 15 epileptics 6 cases showed increased fragility and 2 decreased fragility. The psychoneurotic group, comprised of only 8 cases, was obviously too small to admit of valid induction in terms of percentage deviation but, on the whole, showed only slight change, thus but one case could be detected in which there was indication of increased fragility and two in which there was determined a decrease. In general, no characteristic change seems determinable with regards to age or sex.

The significance of these findings, while of definite interest, is by no means clear although it appears unequivocally, in these cases, that there occurs slight to moderate deviation from the control formula which seems on the basis of both this and other work to admit of but narrow variation in normal individuals. It is conceivable, particularly in the dementia præcox and manic-depressive groups that the fragility change may represent a secondary or reflected effect, dependent in some way upon basic metabolic or

toxic disturbance, a conception borne out by previous reports, as mentioned, of the occurrence, in these states, of other blood changes and indication of the probability of underlying metabolic disorder. Whether or not this applies to the other groups, as well, is obviously a matter of conjecture.

CONCLUSION.

On the basis of this study of erythrocyte resistance to graded strengths of sodium cloride, the determined control formula seems fundamentally to bear out previous work by Greenthal and O'Donnell, and Butler, with findings among psychotic subjects indicative of a tendency for slight to moderate deviation, in both directions, but mainly towards increased fragility, which, particularly in the dementia præcox and manic-depressive groups, may conceivably have a basis in underlying metabolic or toxic disturbance.

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APORRHEGMA REACTIONS IN PSYCHOSES.*

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Eighteen years ago Folin[1] published his classical studies on the metabolism in mental disorders. The most comprehensive and thorough-going analysis of the urine under carefully controlled experimental conditions failed to reveal any peculiarity of metabolism characteristic of any particular form of mental disorder. It has, therefore, not seemed profitable to renew the investigation of the end-products of metabolism found in the urine. The study of the *intermediate metabolism* by means of blood and tissue analysis has seemed to me to promise more significant results, particularly the study of certain much-neglected aspects of the nitrogen metabolism.

As you know, the proteins of the food are split in digestion to amino acids and absorbed, chiefly, if not entirely, in this form. A considerable portion undergoes the process technically described as deaminization, *i. e.*, it has its nitrogen split off. This nitrogen is converted principally into urea and excreted by the kidneys along with a little ammonia. Another portion—and on the usual diet, a smaller portion of the amino acids—is in some manner built up into protoplasm.

But some of the amino acids are robbed of carbon dioxide and by this loss are converted into amines having powerful physiological actions. This ability to decarboxylate the amino acids is possessed by many bacteria, but is not limited to them. Among other plants having this power are ergot and germinating barley. And even the dog, it appears, is able to bring about this reaction. The

* Read at the seventy-eighth annual meeting of The American Psychiatric Association, Quebec, Canada, June 6, 7, 8, 9, 1922.

[1] Folin, Otto, Am. Jour. Insanity (1904), LX, 699 and LXI, 299.

term *aporrhegma* has been coined by Kutscher [2] to designate such substances produced from amino acids by decarboxylation. Among the better-known ones may be mentioned tyramine, histamine, phenylethylamine and indolethylamine. If one can broaden the term a bit to include not only the primary amines but also the substances formed from them by methylation one can include hordenine and adrenalin. One of the most striking characteristics of these substances is that each has a marked physiological action on the circulatory system. They differ in the type of reaction invoked, but they all appear to have a predilection for affecting this particular system.

It is largely on this account that it has seemed worth while to investigate the possibility of their relation to the psychoses. For circulatory abnormalities are among the most common physical signs seen in the psychoses, such, for example, as blueness or coldness of the extremities and flushing of the face. One does not, of course, believe that these circulatory phenomena are the causes of the mental abnormalities. Yet one may plausibly suggest that these physical signs arise from the presence in the body of abnormal metabolites, possibly aporrhegmas, which so disturb the physico-chemical organization as to permit the appearance of abnormal mental processes. Such complicated phenomena must arise from a multiplicity of conditions. Yet it is conceivable that among some of the insane we are dealing with an organization in which disorder has been permitted to appear through the harmful activity of a small, but powerful, minority of the metabolic processes.

The analytical technique for investigation in this field is far from satisfactory—indeed it is almost non-existent. The development of suitable methods has already taken much of my time and promises to take considerably more. It seemed advisable before getting deeply into such a long and baffling research to make some preliminary skirmishes with such crude methods of attack as could be readily improvised. For this purpose it was decided to attempt to discover whether or not psychotic persons showed any tendency toward abnormality in their reactions to certain aporrhegmas

[2] Kutscher, Otto, u. Ackermann, D., *Zeit. f. Physiol. Chem.* (1910), lxix, 265.

experimentally administered. The substances selected were the salts of hordenine, tyramine, adrenaline and histamine in water solution. In order to provide against unfortunate accidents and to make the procedure as simple as possible these substances were not given internally but were placed upon shallow scratches on the skin. It was soon found that there was not much reaction to hordenine, even in strong solution, and that tyramine in dilute solution caused very little reaction, but in the strength of about 1/10 frequently produced a small red papule which disappeared in about 20 minutes. Adrenalin in concentration of 1/1000 gave a white spot, sometimes having a pink areola about it. Histamine in concentrations of the base varying from 1/400 to 1/50,000 gave wheals of varying size resembling mosquito bites, but having usually a more marked hyperemia.

The procedure adopted was to make a series of scratches on the palmar surface of the forearm with a sharp needle, not scratching deep enough to draw blood, and then to apply a drop of the proper solution to each scratch, leaving one as control. After seven minutes the general features of the reactions were noted and the wheals and white spots measured. Thirty-five normals and 47 patients were studied in this fashion. The activity of the solutions was carefully checked during the course of the investigation by repeated tests on certain individuals and by colorimetric determinations. One of the histamine solutions—the 1/10,000 solution—deteriorated and that particular set of observations has therefore been excluded from consideration. It was necessary to renew the adrenalin solutions several times.

Several of the features of the reactions, such as the general hyperemia, the pruritus, the presence and extent of the areola about the adrenalin spots, etc., involve personal judgment to a large extent and are, therefore, not well adapted to careful analysis or public discussion.

On the other hand the width of the wheal raised by a given concentration of histamine is quite definite and objective. Before assuming, however, that the magnitude of this reaction truly represents the sensitivity of the patient, it was, of course, necessary to examine what appeared to be probable sources of error. In the first place the accidental and inevitable differences in the force

used in making the scratch, the length of the scratch, the size of the drop applied, etc., might be thought responsible for much of the variability found. In point of fact these factors are unimportant. The four different concentrations of histamine applied to each subject gave regularly a graded series of wheals, which would not have been the case had these accidental factors been important. Thus, between the size of the wheal caused by 1/400 histamine and that caused by 1/2000 there has been a very high coefficient of correlation, 0.84 ± 0.02, which practically excludes any considerable error from such "accidental" sources. Furthermore, the size of the wheal has shown no correlation with the age of the subject, and finally the thickness or toughness of the skin, so far as could be determined, was without influence.

The reactions of the 35 normal subjects to the 1/2000 histamine solution are represented in the lowest line of Figure 1. Just 40 per cent of the normals agreed in producing a 4 mm. wheal. Only 25 per cent of the patients agreed in producing a 4 mm. wheal. The wheals given by patients were in general a trifle smaller than by normals and there was a much greater variability among them. Their average was 3.4 mm. with a standard deviation of 1.02 mm., whereas the normals' average was 3.9 with a standard deviation of only 0.65. Diagnostic analysis of the material showed that this tendency toward a "relative insensitivity" was not present among the 14 manic-depressive cases, whose reactions were well within the normal range although slightly more variable than the normals, the standard deviation being 0.78 mm., the average 4 mm. On the other hand, among the 23 dementia præcox cases, 9 had very small wheals, only 2½ mm. wide or less, some as small as 1 mm. Only one of the 35 normals fell within this range.* There were three other psychotic persons who had wheals of only 2 mm. width. Two had involutional melancholia and the third was a man of 45 with an acute hallucinatory episode of apparently toxic origin.

* Those who are interested in the "shut-in" type of personality in its relation to dementia præcox may be pleased to learn that the only "normal" subject who produced such a small histamine wheal (2.5 mm.) is quite definitely of this queer, "shut-in" type, and that he has frequently expressed suspicions regarding his food. His favorite suspicion seems to be that saltpeter has been put in his coffee.

There is a suggestion in this that the histamine skin reaction may occasionally be of value in the differential diagnosis of manic-depressive insanity and dementia præcox. For the settlement of

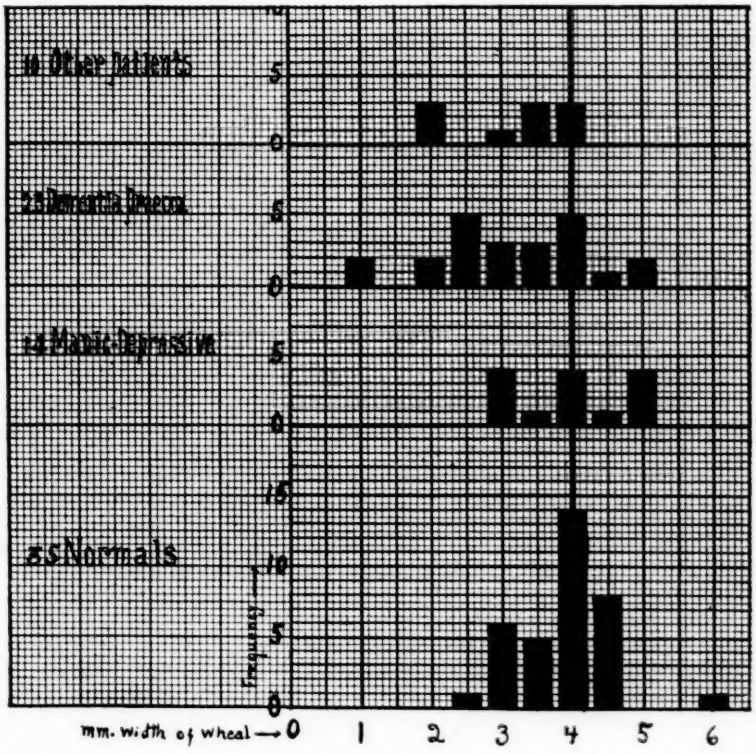

FIGURE 1.—Chart summarizing the reactions to 1:2,000 histamine solution in a series of 35 normal and 47 psychotic persons. The wheals are classed according to width, to the nearest half-millimeter. The height of the ordinates represents the frequency with which a wheal of a particular size was observed in a given group of persons.

this question, however, statistical studies on a large scale will be necessary.

The results presented merely indicate that there is a tendency among some types of psychotic persons to give less than the usual normal reaction to histamine.

But what has this to do with decarboxylation and the nitrogen metabolism? Well, histamine is one of the aporrhegmas, and there are other aporrhegmas with an effect antagonistic to histamine. For example, adrenalin applied to a scratch on a normal skin will prevent histamine from causing as large a wheal as without adrenalin. Perhaps some substance with this antagonistic action may have been present in those cases who showed a small wheal. Other interesting possibilities also present themselves.

At any rate the abnormally small reaction in some psychotic persons appears to be sufficiently marked to encourage the hope that analytical procedures for the detection and estimation of certain aporrhegmas may yield information of value in the understanding of mental disorders.

HÆMATOLOGICAL PICTURES IN ENDOCRINE SYNDROMES FOUND ASSOCIATED WITH EPILEPSY.*

By HAROLD A. PATTERSON, A. M., M. D., LL. D.

The keen interest centered in, and the concentrated attention focused upon, the diversified aspects of the problem presented by disorders of the endocrine system have produced much stimulating research during the epoch-making period of the last few years, and amid such fruitful investigations our attention was naturally directed to a consideration of the possibilities of those phases of the general problem which seemed particularly to fall within our province at Craig Colony. From this point of view, the opportunities in connection with a study of the blood findings in our endocrine patients seemed rather promising and, consequently, an attempt was directed toward the investigation of the hæmatology of various endocrine syndromes and borderline cases of which there are a fair number at the colony. In the study of these blood pictures, a survey has been made of a number of different types of abnormalities attributed to a disorder of the glands of internal secretion. To present the salient facts gathered from this inquiry is the purpose of this paper.

Practically all colony patients presenting symptoms of an endocrinopathy have been studied hæmatologically. This embraces a total of 128 individuals. Of this number, a large percentage comprises cases of pituitary disorder; and within this group itself by far the larger portion is included under the classification of hypofunction, while hyperfunction and dysfunction rank in the order named. Next in point of number are hyperthyroidism and hypothyroidism collectively. A moderate list of patients in whom the predominating complex is evidently gonadal and a rather small group which presents a disturbed function preeminently of the

* Read at the seventy-eighth annual meeting of The American Psychiatric Association, Quebec, Canada, June 6, 7, 8, 9, 1922.

adrenal type are also included in the series. This series covers a rather wide range of glandular disorder, varying in degree from the frank and extreme clinical manifestations on the one hand through cases which are less clear cut to the extreme borderline cases on the other. The principal part of the collection is composed of cases approximating the mean, since the frank and extreme ones are naturally relatively few and the questionable borderline cases have, in most instances, been omitted from the series for obvious reasons. The relative frequency of the various glandular dystrophies is given in Table I.

TABLE I.

Pituitary:	
Hyperpituitarism	14
Hypopituitarism	85
Dyspituitarism	7
Thyroid:	
Hyperthyroid	6
Hypothyroid	6
Gonadal	7
Adrenal:	
Hyperfunction	3

Before proceeding to a detailed consideration of the findings in each of these types, a word of explanation in regard to the matter of the technique employed is in order. The cases were selected from their respective services by the various members of the medical staff of the Colony, upon whom devolves the responsibility for the clinical diagnosis and to whom the writer is indebted for their prompt and hearty cooperation throughout the course of the investigation. The blood for these examinations was procured from these previously selected patients by the author himself and the subsequent examination of the blood was conducted either by the latter or by a competent technician under his immediate supervision. Thus all the tests of the entire series were made by one of two individuals both of whom used a uniform technique throughout, even when checking results on normal individuals who served as a control. By this means a constancy of condition was maintained throughout the period of our investigation, which materially enhances the comparative value of the results obtained. Before making the actual enumeration of the total number of leucocytes

and erythrocytes, the pipettes were shaken for five minutes in a shaking apparatus—operated by a small electric motor—thus providing a uniform mechanical agitation in each instance. Further, a settling period of five additional minutes was allowed in the counting chamber before the count was attempted. In the preparation of the differential smears, coverslip films stained with Wright's stain were used. Two hundred cells were counted in every instance and three hundred where the occasion seemed to demand it. This accounts for the fractionation which will appear in subsequent reports of the differential count.

Since the nomenclature which the writer employs here varies somewhat from that in general usage and is, in his opinion, more descriptive, a further word of exposition is perhaps advisable. The terms "poly" (polymorphonuclear neutrophile) and eosinophile are used in their usually accepted sense. Under the heading of lymphocytes he has included the two varieties sometimes separated; namely: The large and the small lymphocyte since the only difference between the two lies in their relative size which is an indication of the age of the cell, but is of no significance in our present consideration. By the designation "Mast Cell," the author refers to what some of you may know as a "polymorphonuclear basophile" although it is often spoken of simply as a "basophile." The name "transitional cell" is one of time honored but questionable propriety, since it is used in reference to a cell which we now know is not in the transitional stage, but is a fully developed adult cell. That he prefers to call an "endotheliocyte" as it is a large cell endowed with phagocytic properties, which has its origin from endothelium. These are the cells which Mallory names "endothelial leucocytes."

At this point, it becomes necessary to anticipate a conclusion drawn from the results of an unpublished but nearly finished investigation which has been carried on concurrently but independently in the laboratory and introduce that conclusion here. In examining the blood of a large number of epileptic patients—many of whom were distinctly not of a pathologically endocrine make up—a hyperleucocytosis varying from 10,800 to 34,200 was found in 92 per cent of these individuals. Non-epileptic controls studied under identical conditions failed to demonstrate any such increase. From this data, it is an obvious conclusion that the usual leucocyte count

in a given epileptic individual generally exceeds the accepted average normal, often by a very large excess. The significance of this conclusion will become apparent as the discussion proceeds. With these necessary explanations met and out of the way, we are now ready to proceed to a consideration of the material at hand.

Let us then consider glandular disturbances of the thyroid. In our series is a group of six cases of hyperthyroidism. This is of interest in itself in that the association of this condition with epilepsy is considered quite infrequent. One half of this group presented the picture of a slight chlorotic anemia, while an equal number provided a normal picture with regard to hæmoglobin and erythrocytes. Strangely enough, this leaves us neatly suspended midway between the views of the older authors and those of more

TABLE II.

Initial.	Hæmo.	Red.	White.	Poly.	Lymp.	Endo.	Eosin.	Mast.	
B. G.	80%	5,216,000	15,200	62	24	13	1	0	
M. M.	80%	4,692,000	14,200	65	25½	8	1½	0	
G. B.	75%	4,928,000	10,000	55½	30	12	1½	1½	
G. P.	80%	4,786,000	20,600	69	20	10½	0	1	
E. C.	80%	5,568,000	15,000	56½	35½	8	0	0	
B. B.	90%	5,344,000	17,000	58	32½	7½	1½	0½	Partial thyroidectomy.

recent writers on this still somewhat controversial issue. In place, however, of the leucopenia described in this condition by Kocher, and later by Plummer and apparently generally accepted, there was in all of our cases a moderately high leucocytosis. This inversion of the leucocytic formula is attributed to the increased leucocyte count previously referred to as so frequently seen in epilepsy. When it is recalled that Kocher lays considerable stress upon the diminished white count as a diagnostic point in obscure and borderline cases, the importance of the last cited observation becomes immediately apparent. The relative lymphocytosis usually ascribed to this condition was present in all of our cases and the comparatively high mononucleosis found in all of them was due in part to this and in part to a very marked proportionate increase in the endotheliocytes—a condition of which the writer finds no mention in the literature and which he believes he has been first to describe.

One case in this group had had a partial thyroidectomy some time before she came under observation in this study and yet her blood findings differ so little from those of the others that one is easily lead to concur with the assertion of the Scandinavian investigators (Solling and Sandelin) that the hæmatological picture is of little value as a criterion of an indication for thyroidectomy. Table II shows the blood finding in this group.

Our group of hypothyroid individuals also numbered six patients, three of whom were cretins. In the latter was found a normal red count, but a white one very different from that usually attributed to this disease for, in place of the customary polymorphonuclear decrease, there appeared a moderately high leucocytosis. The reason for the latter has already been intimated. In the individual who presented the most frank and clear cut picture of sporadic cretinism, the differential count revealed a very high mononucleosis in which, although the lymphocytic type of cell was proportionately increased, the endotheliocytic factor showed a striking relative preponderance in the post paroxsymal period. At other times and in the other two cases, the reverse was true, the differential count being practically identical with that presented by the remaining cases. The hypereosinophilia so often accompanying cretinism was present in one of these cases alone, and in a mild degree only. In the remainder of this group their appeared a slight secondary anemia. Here the normal leucocytic formula was altered by a sharp mononuclear rise. The predominating type of cell, however, was the lymphocyte although the endotheliocytes show a moderate relative increase—usually less, however, than in the preceding hyperthyroid group. The hypereosinophilia noted by McCarrison was entirely lacking in these.

Before leaving this phase of the subject, it seems worthy of remark that while the blood findings, both of hyperthyroid and hypothyroid states present certain characteristics which are of some value as corroborative evidence in the recognition of a disorder as being primarily of thyroid origin, in instances where the hypereosinophilia fails to appear, as in the cases just stated, the hæmatological picture differs only in the quantitative relation of the endotheliocytes. In such cases, the difference may be scarcely sufficient to distinguish between the two and under these circumstances the blood picture is of practically no value whatsoever, as a dis-

tinguishing point in the differential diagnosis between these two conditions. Table III offers data on the group last discussed.

The next group which presents itself for our consideration is the one into which have been placed those who present symptoms

TABLE III.

Initial.	Hæmo.	Erythro.	Leuco.	Poly.	Lymph.	Endo.	Eosin.	Mast.	
S. P.	80%	5,568,000	16,800	56½	36	7	0½	0	Cretin.
				41	40	24½	3½	1	
M. E.	75%	5,504,000	19,800	44½	39½	4½	10½	0	Cretin.
J. K.	80%	5,280,000	16,600	61½	35	3	0½	0	Cretin.
H. W.	75%	4,712,000	13,600	66	22	8	3	1	
L. G.	85%	4,194,000	13,000	47⅓	34	10	6	2⅔	
M. R.	85%	4,488,000	12,300	54	32	8⅓	4⅓	1⅓	

suggesting hyperpituitary activity. Among the fourteen patients included in this group are two cases which are distinctly of the acromegalic type. This entire group presents either a normal red count or a slight and not significant anemia. On the other hand, the normal or slightly reduced white count which would naturally

TABLE IV.

Initial.	Hæmo.	Erythro.	Leuco.	Poly.	Lymph.	Endo.	Eosin.	Mast.	
J. F.	80%	5,472,000	12,200	36½	52½	9½	1	0½	Acromeg.
A. S.	75%	5,238,000	13,000	39	58½	2½	0½	0	Acromeg.
M. W.	85%	5,230,000	8,400	49½	45	5	0½		
A. E	80%	4,448,000	9,400	66½	37½	5½	0½	0	
M. D.	80%	4,208,000	10,800	59	36	5	0	0	Wasser.4+
F. C.	85%	5,440,000	18,200	61	35½	2	0	0½	
L. S.	85%	4,992,000	15,200	64	32½	3½	0	0	
A. H.	70%	4,890,000	10,200	58	31	5	4	2	
L. N.	80%	5,360,000	10,000	50½	40	6	2½		
J. F.	85%	5,260,000	11,800	55	34	9½	0½	1	
L. C.	80%	4,980,000	14,000	56	32½	8	3	0½	
A. S.	75%	5,238,000	13,000	69	28	2½	0½	0	
G. E.	85%	5,456,000	13,800	58½	25	14½	1½	0½	
A. H.	85%	5,312,000	17,800	79	18	7	0	0½	

be anticipated in a non-epileptic individual, is distorted by the concurrent epilepsy with two exceptions. The leucocytic formula becomes inverted due to the idiopathic hyperleucocytosis of the concomitant condition. In addition, the differential count shows a varying and sometimes high mononucleosis in which the lympho-

cyte assumes the major rôle. In fact, it was in this type of endocrinopathy that the highest permanent mononucleosis met with, was encountered. A slight eosinophilia is present in several of these cases, but on the whole this is rather less than might be expected. Table IV presents the hyperpituitary group.

The hypopituitary group contains by far the greatest number of individuals under observation and may be divided into three classes; namely, well defined cases of hypophysial dystrophy; cases somewhat more obscure; and cases which have been treated with organic extract together with borderline types. Each of these divisions presents a blood picture that is quite distinctive in a typical case, although any individual may pass successively through

TABLE V.

Initial.	Hæmo.	Erythro.	Leuco.	Poly.	Lymph.	Endo.	Eosin.	Mast.	
D. P.	85%	5,868,000	10,800	53	22⅔	5⅓	19	0	Dys. Adipog.
E. H.	90%	4,492,000	16,600	54	28	4	14	0	
M. H.	85%	4,832,000	17,200	53	34	4	9	0	Sarcoma L. B.
C. K.	75%	5,958,000	12,000	48⅔	33⅔	8	8⅔	1	
G. P.	80%	5,504,000	13,600	50	38	3½	7½	1	
H. F.	90%	5,152,000	21,600	46½	41	3½	7	2	
S. M.	85%	5,524,000	15,600	43	42	7	6	2	
G. B.	90%	5,104,000	11,800	70	15½	4½	6	4	

all the stages either in a progressive or a retrograde fashion. Certain features are also common to all three. They all provide a normal red cell count while the usual leucocyte formula accompanying this disorder is distorted in all three instances by the idiopathic leucocytosis superimposed upon the original leucopenia. In the first subdivision of this group, the cardinal features of the blood picture are a moderately high mononucleosis in which both the lymphocytes and the endotheliocytes participate, although the latter predominate slightly, and a moderate hypereosinophilia which reaches its maximum in a pretty well-developed case of Froehlich's Dystrophy Adiposogenitalis (cell count of 19) that is included in this group. Table V illustrates the hæmatology of this type:

The next, or intermediate division, of this large class constitutes the largest of any one individual type in the cases studied. The

lack of significant findings in the erythrocyte determination and the inversion of the leucocytic formula has already been referred to. The principal point of interest in connection with this collection lies in the uniformly high percentage of the mononuclear elements which show both a relative and an absolute increase and exhibit the highest average level noted in any of the conditions under consideration. This high mononuclear count is chiefly due to the augmentation of the lymphocytes although the endotheliocytes contribute a moderate quota. The eosinophiles are normal in number or maybe slightly increased in one or two instances. Table VI indicates the hæmatological findings in these cases:

TABLE VI.

Initial.	Hæmo.	Erythro.	Leuco.	Poly.	Lymph.	Endo.	Eosin.	Mast.
S. D.	80%	4,896,000	18,000	43½	52½	4	0	0
A. M.	85%	5,452,000	17,600	43	48½	8	0½	0
B. D.	75%	5,248,000	15,400	43	48	4	4	1
A. S.	75%	5,538,000	13,400	39½	45	10½	5	0
R. T.	70%	5,280,000	20,800	51	44½	4½	0	0
R. F.	80%	5,376,000	10,600	48	43	8	0½	0½
R. C.	75%	5,280,000	16,200	50	43	4½	1½	0½
R. C.	80%	5,568,000	11,200	45	42½	7½	4½	0½
H. F.	90%	5,440,000	23,400	45½	41	8½	2	3
J. D.	70%	5,152,000	21,600	51½	41	4	2	1½
F. C.	85%	4,992,000	15,000	52	40½	6½	0½	0
E. M.	90%	4,786,000	14,200	54	40	6	0	0
H. N.	80%	5,088,000	14,200	52½	39½	7	0½	0
E. C.	80%	4,332,000	15,000	47	39	10	4	0
G. R.	85%	5,856,000	25,000	52	38	6	4	2

Lastly, there remains of our attention those instances of hypopituitarism, in which the picture has been modified by organotherapy, or is of an abortive borderline type. On the one hand, as the disease process advances in the individual, a series of successive changes are gradually induced so that a transition is brought about by almost imperceptible degrees from the normal blood findings through the intermediate stage immediately described above to the final picture which the more fully developed types assume. On the other hand, when hormone therapy is attempted, a reversal of the process takes place and retrograde changes develop in precisely an inverse order. Shortly after the initiation of glandular therapy, the hypereosinophilia of well-defined cases begins to fade

and shortly disappears. The mononucleosis, however, tends to linger and declines gradually. The leucocytosis remains unaffected by the glandular extract as would naturally be anticipated.

The phasic character of these changes is of some value both in diagnosis and in prognosis. A persistent mononucleosis may prove a valuable bit of corroborative evidence in a none too clear case or, conversely, may offer a criterion for determining the efficiency of glandular therapy and a rough index of individual response to such treatment. Table VII shows a number of cases which have received glandular therapy for a varying period of at least several months. Successive stages of transition from a persisting mononucleosis on the one hand to a perfectly normal count on the other are quite apparent. The seeming decline in the total leucocyte

TABLE VII.

Initial.	Hæmo.	Erythro.	Leuco.	Poly.	Lymph.	Endo.	Eosin.	Mast.
A. D.	90%	4,480,000	14,200	54	43	5	0	0
D. G.	80%	5,603,800	7,400	56⅔	32	8⅔	2	0⅔
J. C.	80%	4,736,000	9,800	66	24	8⅔	1⅓	0
N. C.	85%	4,992,000	8,600	58⅔	35	5	1	0⅓
N. B.	95%	4,976,000	13,400	65½	30½	4	0	0

count is misleading as it happens that these three boys have never shown a leucocytosis.

A small number of patients, seven in all, were encountered during the course of our inquiry who presented evidences of having originally possessed hyperactive pituitary glands, but who also gave indications that such a period of activity was over and the gland was quiescent and probably somewhat in abeyance. To such a manifestation, where a combined hyper- and subsequent hypoactivity of the gland seemed probable, the writer applies the term dyspituitarism. In these bizarre conditions, the blood may show nothing unusual or it may display a slight mononucleosis in which the lymphocytes and the endotheliocytes are increased in about the normal relative proportion.

In the latter condition, the findings may provide a slight diagnostic clue which is, however, never more than a mere suggestion, but

usually the blood picture here is of no diagnostic or prognostic value. Table VIII presents the findings in these cases:

TABLE VIII.

Initial.	Hæmo.	Erythro.	Leuco.	Poly.	Lymph.	Endo.	Eosin.	Mast.	
S. G.	75%	5,152,000	26,000	77	20	2	0	1	Nystagmus.
G. W.	80%	5,024,000	14,400	64½	33½	1½	0½	0	
J. G.	75%	4,768,000	15,400	52½	35	10	1	1½	
J. C.	80%	5,104,000	10,600	56½	33	8	1½	1	
E. D.	85%	5,440,000	14,000	54½	33	11½	0½	0½	
L. B.	85%	4,848,000	17,600	68	20½	10½	0½	0½	

A heterogeneous group into which have been crowded a number of patients in whom an improper functionation of the gonads or the adrenal bodies proclaims itself, completes our series. In those complexes where gonadal influences seem to predominate, the

TABLE IX.

Initial.	Hæmo.	Erythro.	Leuco.	Poly.	Lymph.	Endo.	Eosin.	Mast.
R. L.	85%	5,896,000	9,200	55	29	15	0½	0
A. H.	70%	5,776,000	11,800	59½	26½	1½	2	1
M. F.	80%	5,216,000	13,400	64⅓	30⅓	3⅓	2	1⅓
G. J.	80%	5,216,000	12,600	64	24	8	2½	1½
B. B.	90%	4,768,000	18,000	59	28½	5½	7	0

TABLE X.

Initial.	Hæmo.	Erythro.	Leuco.	Poly.	Lymph.	Endo.	Eosin.	Mast.
A. G.	80%	5,120,000	13,800	66	28	6	0	0
M. B.	85%	3,648,000	15,000	65	31½	3	0	0
N. M.	90%	5,071,000	14,000	47	41	6½	3	2½

blood examination offered nothing that was singular or even of suggestive import. Likewise, in malfunctions preeminently of the adrenal type no constant abnormality—but rather a lack of it—characterized the blood picture. This failure to exhibit the polynuclear and lymphocytic reaction sometimes attributed to such a

condition, probably lies in the fact that our cases were not extreme. Both these types show a moderately high leucocytosis which must not, of course, be regarded as a part of the hæmatology *per se*. Table IX incorporates the results of our gonadal studies and Table X those derived from the adrenal investigations.

In conclusion the points which it has been attempted to make in this paper may be summarized as follows:

1. One hundred and twenty-eight cases presenting some endocrine manifestation in an epileptic individual have been examined.

2. Of these, the overwhelming majority falls into the pituitary group.

3. The leucocytic formula in all these disorders is either distorted or masked by the epileptic hyperleucocytosis.

4. Hyperthyroidism shows a high mononucleosis with a decided relative endotheliocytosis.

5. The hæmatology of hyperthyroidism is of comparatively little value as a surgical indication for thyroidectomy.

6. Hypothyroidism presents a picture similar to hyperfunction, but differing from the latter by a lesser quantitative endotheliocytosis.

7. In the absence of eosinophilia, a blood examination is of little value in differentiating these two conditions.

8. Hyperpituitarism presents a mononucleosis chiefly lymphocytic, which may rise to a high peak.

9. Hypopituitary manifestations may be divided into three classes, viz., Frank cases with a hypereosinophilia and a mononucleosis including both a lymphocytosis and a slight endotheliocytosis; less well-devloped instances which provide only a sustained mononucleosis of the above type; and borderline and treated cases in which the blood picture follows a sliding scale and is of some prognostic value.

10. Dyspituitarism offers a variable blood picture of no moment.

11. Gonadal influences produce no characteristic alterations of the blood findings.

12. Likewise, adrenal malfunctions fail to provide a unique picture in our observations.

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LONG-SECTION METHOD, CONTRA CROSS-SECTION METHOD IN THE STUDY OF MENTAL DISEASE.*

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This paper deals with a method rather than with results. The method reported offers two features of interest. It involves a long-section study of mental disease and it involves a close correlation between the results of investigations carried on from varied aspects. Although the effort to find correlation between the different fields has not as yet given any definite result, the long-section feature of the procedure has already given certain findings of interest from the standpoint of the various laboratories. Some of these results have been published in detail (in the *Journal of Abnormal Psychology and Social Psychology* and the American Journal of Psychiatry) and need only to be referred to here. During the course of these studies there has arisen, in some of the fields, the necessity for modifications in the procedures and the advisability of the development of new procedures for the study of more fundamental phenomena in certain fields. This has of necessity involved breaks in the continuity of the studies.

In view of the variable phases of any given psychosis not only in its appearance in different patients, but also in its manifestations in different moments in the same patient, it naturally strikes us as necessary to consider the developmental side of the disease. Patient changes from time to time—as appears clearly in the partial or complete remissions so frequent in præcox patients—though of course the total psychosis binds these moments into a more or less unitary process. Consequently, the description of any malady can be nothing beyond the description of a development in time—a

* Read at the seventy-eighth annual meeting of the American Psychiatric Association, Quebec, Canada, June 6, 7, 8, 9, 1922.

film showing changes of the labile conditions from day to day, week to week, month to month.

In spite of these considerations a large majority of the scientific studies of psychoses have been made as cross-section studies. A certain number of clinical or laboratory tests are made at the moment of the admission of the patient to the hospital or at some other more isolated moment of his stay at the institution. To obtain statistical material tests have been made on groups of similarly diagnosed cases. Thus, a certain constellation of tests have been made: for instance, on a group of dementia præcox cases; another, on manic depressive cases, etc. Investigators employing this method have very often been forced to admit their results to be of a very inhomogeneous and variable character for the different subjects, even though all these subjects may have been labeled similarly by the diagnostician. Thus Yerkes in 1921, in a study of the ideational behavior in normal, deficient and mentally deranged subjects (*Journal of Comparative Psychology*, 1921) found pretty constant results for his normal and deficient subjects, but for the psychotic ones results so inhomogeneous and variable that he could make no generalizations at all. To quote: "It has not seemed worth while to present statistical data for the group or groups of mentally deranged cases observed. Averages, it appears, are rather more likely to conceal than to reveal the significant facts. The groups are almost hopelessly heterogeneous, for in addition to individual age, race, sex, educational and social psychological differences, there appear individual differences of mental diseases. Moreover, even when an attempt is made to lessen this heterogeneity by classifying the subjects according to diagnosis in such groups as dementia præcox, general paralysis, and so on, the degree of heterogeneity is extremely great because the various cases were studied in different stages of the development of their disease."

Findings of this sort undoubtedly indicate the necessity in the study of mental cases, of applying a long section method, that is to say a method aiming at the following of the changes in each disease more than at the stating of what is temporarily characteristic of one single phase of the disease. The long-section method compares the patient with himself at different times, not attempting

simply the comparison of him with other patients, and this constitutes its most important feature.

In the field of general medicine, Sir James MacKenzie by his patient and repeated observations on patients with cardiac disorders has demonstrated that very valuable information, unobtainable by cross-section methods, may be secured through the long-section study of the individual cases.

The second factor in the working plan outlined here lies in the correlation of results obtained through studies on different aspects. The necessary condition for the practical carrying out of this intimate correlation, the variability of the symptoms in the insane being taken into consideration, is the synchronous nature of the different studies. If, as has just been pointed out, the study is to be a long-section one it is necessary to develop curves picturing the different findings, all of which have as their abscissæ a common time unit. Any number of such curves can be developed based on any number of researches from any laboratory, the necessary condition for the correlation being only the strict observance of the same time unit in the plotting.

All such laboratory curves should be correlated with clinical descriptions giving the gross interplay of symptoms as they occur on the ward. For this purpose the development of clinical curves are of considerable importance and have been attempted in connection with our work.

A curve can only be developed when the material plotted allows of quantitative expression. Quantitative analysis is very often the sort obtained from the laboratories so that as far as this part of the work is concerned no difficulties present themselves. However, the more complex the material becomes the more difficult will be its expression in quantities and this is especially true for the rating of such characteristics as personality traits and the changes in these traits. While laboratory work chiefly deals with elements which are isolated and studied separately, clinical observations deal with complex reactions to social and non-social environment. These reactions include the most complicated systems of response in which such factors as ideation and contentional judgment are involved. The only available way of expressing this material in quantities seems to be the assumption of a certain number of categories of

personality traits and the gradation of the patient in reference to each category by a number of independent observers. This method, which is of course unscientific in the strictest sense has been used to obtain data of correlation to more exact findings in social psychology and in experimental work on personality rating. In our laboratory it has been used once in this connection, the question being the gradation of a number of patients according to the degree of ascendency and submissiveness. On a broader basis the same thing has been done in the construction of a clinical curve of the long-section sort in the rating scheme for conduct which we have been employing.

One reason which has lead to the adoption of the long-section method of study has been the following: Different kinds of tests made on a patient at the time of his entrance to the hospital can have prognostic significance only after a careful study of the developmental side of the type of psychosis he shows has been made on a long-section basis. If, on the other hand, the curves of a long-section study in all its different aspects show that a certain temporary constellation of symptoms has a definite tendency to be followed by definite changes in the inter-relation of these various aspects, the discovery of this constellation in a new patient at a single moment makes it possible to some extent to give prognostic statements. However, to judge from the data now at hand, there apparently exist similar cross-section constellations followed by very dissimilar developments. Thus, our present data is so uncertain that we are unable to make prognostications even on the basis of a long series of cross-sections, but as more data is secured we may expect to predict on the basis of fewer and fewer cross-sections, until the time when one cross-section will suffice.

During the last generation, the clinical study of mental disease has been made roughly on a long-section basis. It was particularly from studies of this sort that Kraepelin was able to delimit the so-called manic depressive group. The peculiar additions made here, then, are the employment of just so accurate measurements in the making of long-section studies as have characterized the cross-section studies to date and the attempt to correlate the findings of the separate observers.

We have the hope that the data obtained by our long-section studies may afford an opportunity of interpreting somewhat more

precisely than is at present possible the significance of whatever mental or physical states may be observed in the patients studied. We have in psychiatry, it is true, a considerable number of descriptive terms whose diagnostic or prognostic significance is generally agreed upon; yet our ignorance is abysmal concerning the exact nature of the mental and physical sub-soil upon which these symptoms flourish. The long-section method may, it is hoped, throw light upon these problems. The introduction into these curves of a common time unit on the abscissa makes it possible to study in correlation the temporal relation of the occurrences of the different changes and this is philosophically the basis for finding causal relationships.

The fact that the method involves cooperation on the part of a large group of men, each studying the same phenomena from his own point of view, enables us to get a much broader picture of the phenomena in question. Thus the psychologist, the chemist, the physiologist, the clinician and the nurse each contributes his observations to this system. The method will have an added interest when the therapeutist is also involved and the study of changes in connection with treatment is made. This addition may lead to results of immense practical value for the future.

The carrying out of studies on the basis of the long-section method is undoubtedly slow and tiring. The very long run of changes in mental diseases may often make it necessary to work even for years on the same subject and the same test. If, on the other hand, one considers what is gained of certainty in the results obtained, an attempt along the lines of long-section study seems very much worth while.

DISCUSSION.

DR. PLANT.—Mr. President, when we were first considering this paper it was my own idea, at least, that we would present here some of the results of the long-section work that we have been trying to carry out. However, that involved such a tremendous amount of detailed data, data which is to appear in the forthcoming issue of the *Journal of Abnormal Psychology*, that it finally seemed better simply to present in this paper the fundamental notions involved. From the laboratory point of view this means the carrying out of elaborate procedures upon one and the same patient at weekly intervals over an extended time—a year or more. In following these results along the attempt is to delineate the stream of that patient's progress rather

than to take cross-section views at a few quite distinct points. This method studies the stream, knowing little of its source or the end to which it is going. Of course, many studies of personality, many searches into the dynamic problems of psychoses, claim to do that. This they do not do, in that the past and the future are constructed on the basis of what is found in one cross-section study of the personality involved. We reiterate that we are not interested in the patient's conditon to-day or next week but the *accurate measurement* of the *relation* of one of these states to the other

Our second point of interest has been the fact that these laboratory procedures have necessitated an attempt—however rough at the present time—to find a corrolate in the actual clinical progress of the case. It is an attempt to do that, at present in an exceedingly crude way, very crude, that we have been developing the charts of which I spoke yesterday. From an administrative point of view this second point is of paramount interest. The progress of a hospital lies in the path of binding together, not only the work of all of the laboratories, but also of every possible source of psychiatric information within that hospital. This has led us to hope, over and above whatever implications there may be in our philosophical notions, that if this work is taken up elsewhere it may perhaps mean another step away from the present isolation and insulation of the clinical work from the laboratory work of the modern psychiatric hospital.

Dr. Abbot.—Mr. President, it seems to me this is a very interesting method of getting a cooperative history of the case and reducing it to a graph, combining the data furnished continuously by laboratory men and by the clinician, as Dr. Plant has said. It contains the possibility of leading to the collection of more and more accurate data about patients.

FOLLOW-UP WORK IN MENTAL AND SURGICAL CASES.*

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Follow-up work on consecutive cases is here presented with the object of comparing the results obtained by the psychiatrist with those obtained by the surgeon and the internist.

The total number of women admitted to the Pennsylvania Hospital during the years 1914, 1915, 1916, deducting duplicates, was 377. Selection before admission has resulted in a smaller proportion of cases of hopeless organic dementia—14 per cent as against a general average of 31 per cent in all the Massachusetts state hospitals.

In Table I are the results as judged from a review of the cases *five years after admission* to the hospital. Where there was any doubt about the case a lower rating was always chosen.

TABLE I.

Recovered.	Improved.	Deaths.	Unimproved.	Total.
94	68	101	114	377
25%	18%	27%	30%	100%

RECOVERIES.

Only those were counted recovered who had for some years maintained themselves in ordinary living conditions in what, judged by their own pasts, was complete health, and judged by other lives, was at least an average mental condition. So manic-depressive cases, who had righted themselves from two or three attacks in the five years and are well at the end of the five-year period, were not counted as recoveries. The complete subsidences

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of acute psychoses in patients showing psychopathic inferiority were also not counted as recoveries though the patients had reached and maintained their own normals. There are left 94 recoveries or 25 per cent of the total number followed. Of these, 39 were admitted within a month of the first symptoms and only six had waited for over a year from onset to hospital treatment.

I quote from two letters received. The first is dated October, 1921, and tells about a patient who left the hospital in October, 1916:

> I take the greatest pleasure in informing you that my wife is well . . . . in fact, she has never felt better in her life . . . . she is not nervous or has not the slightest trace of her former trouble. I wish to thank you for your interest in her, which is rather unusual in these times, as most hospitals don't care what becomes of you after you leave.

The second letter from the husband of a self-accusatory patient, who remained at the hospital two weeks and was no better when she left, says:

> I took her to another sanitarium for a few weeks. I could see no improvement so I brought her home. . . . . We commenced treatment with ——, a chiropractor; on the fourth treatment we saw a change. He said her trouble was caused by a pressure on a nerve between the vertebra. He simply relieved that pressure. No doubt you have other patients who could be relieved by the same treatment.

The usual history for these 90 odd patients is of uneventful, normal living under as many trying conditions as are met by most people.

IMPROVED.

The reader will understand the wide variations in the "Improved" group, containing 18 per cent of the followed cases, which ranged from patients who are holding better positions than ever before to those who require constant care at home. As a whole the group is self-supporting.

DEATHS.

The 27 per cent of deaths include all who died without having had a long period of full recovery. For instance, it included a patient with aortic stenosis who recovered from psychoses in 1915 and 1917 at the hospital, but died of pneumonia in October, 1918,

with no return of mental symptoms but with only 11 months between the last mental symptoms and death. Of 101 deaths 49 were over 50 years of age on admission and four were over 90 years old.

UNIMPROVED.

The "unimproved" 30 per cent forms the slightly largest group with 114 cases. Many of these might have been placed among the "improved"; 18 have made one or more recoveries from manic-depressive psychoses during the five years; many of them have gone home and some to work. But from the five-year point of view the results are thoroughly unsatisfactory.

COMPARISON OF THE THREE GROUPS.

Certain differences stand out as we divide the cases followed into groups which include allied as well as true forms.

TABLE II.

	Recovered.	Improved.	Died.	Unimproved.
Manic-depressive psychosis and allied.....	61	32	38	29
Dementia præcox and allied.....	2	8	6	64
Senile arterio-sclerotic and other organic brain diseases. Psychoses with pellagra. General paralysis	0	0	33	4

It is striking that the manic-depressive group contributes largely to all results. Seven deaths were directly due to excitements or depressions. Dementia præcox not only contributes almost exclusively to the "unimproved" group, but it happens that five of the six cases recorded under deaths were those of patients removed from hospitals and taken home. Why is it that we have so many deaths from manic-depressive psychosis and so few from dementia præcox? Is it because we get the dementia præcox case later or that it has a short acute period? Do early cases die at home or at hospitals under other diagnoses? It is fair to state that the manic-depressive patients were considerably older.

COMPARISONS WITH SURGICAL WORK.

When I try to compare the results in psychiatric work with those in surgery I find no follow-up work on consecutive admis-

sions for any given length of time. There are plenty of reports on follow-up work in operations in a given disease. Dr. Codman, in his account of the first five years of a private hospital, has given very unusual and valuable information in 314 consecutive cases in a way that makes a parallel possible, allowing for the essential differences in mental and surgical material, and the fact that the surgical cases were followed only to an end result that might appear in a couple of weeks. For example, 12 of the surgical cases came in for a cure of inguinal herniæ; such patients coming in good general health for a local repair have no analogue in admissions to a mental hospital except perhaps in an out-patient department. However, all these cases and similar ones are included in the following statistics because no fair way can be found to rule them out:

TABLE III.

RESULTS IN CONSECUTIVE ADMISSIONS.

	Recovered. Per cent.	Improved. Per cent.	Deaths. Per cent.	Unimproved. Per cent.
377 mental patients. Five-year results....	25	17	27	31
314 surgical patients. End results.....	55	18	16	11

We have to notice that the surgeon sees 30 per cent more recoveries and 20 per cent less unimproved. The difference in deaths is not so considerable when we remember that many surgical cases were followed for very short times.

It is seldom that a psychiatrist can go as directly to good results as did the surgeon in the following case (277), and so quickly: "Patient in shock, pulse barely perceptible, abdominal symptoms for 20 hours; explanatory laparotomy; typical ruptured tubal pregnancy found and left tube and ovary excised; indirect transfusion from patient's sister immediately after operation; patient rallied well and had comfortable convalescence and no complications. A year after she was well." This is the sort of case that makes the young physician turn to surgery.

But it is interesting to see how the surgeon comes out when he gets nearer to the psychiatrist's field. His case 241 is a man with pain in the groin; for this symptom the following surgeons had operated without any relief: Dr. S. J. Mixter, Dr. J. S. Mumford, Dr. H. O. Marcy, Dr. M. H. Richardson, Dr. C. A. Porter. Dr.

Codman followed their example in every respect with this result: Five months after, "pain as bad as before"; a year and a half after, "I am feeling fairly well but at times the pain from the cut nerve is almost unbearable. As a result I am unable to tackle anything requiring strength." And no one could imagine a finer group of surgeons.

Case 253 is a fine piece of surgical work, removal of infected kidney and repair of uretero-vaginal fistula following a previous hysterectomy for cancer. Sixteen months later fine surgical result, but "referred to hospital for epileptic seizures which she had for several years." Nothing better illustrates how the recovery of a part may coincide with the disintegration of a whole, or the differences—which are understandable and proper—between the surgical and psychiatric viewpoints.

As I turn to internal medicine I find Dr. Christian saying, in a general discussion, "After all, we deal with many diseases whose exact cause we do not know and we are confronted with an extremely large group of patients suffering from those chronic conditions to which we can bring only amelioration of suffering and a retardation of the processes." While Dr. McCrudden, continuing the same discussion, says, "The internist deals with chronic disease in which improvement in functional activity of the patient is the aim of therapeutics."

Is there any reason why a psychiatrist getting 25 per cent recoveries after illnesses which have drawn into action all the forces of the person should not feel his work compares well with that of the surgeon who is getting 55 per cent from general and partial illnesses? Do we need to be apologetic for several years' normal living in our patients because they may sometime have another attack? How many surgical recoveries will have worse conditions come later? How much good surgical work has been done on patients not worth saving? Do psychiatrists save any unusual gifts and virtues to the community?

Some time 10-year follow-up records in consecutive cases will be available in mental, surgical, and medical hospitals and will help to answer these questions.

PSYCHOLOGY IN MEDICINE.*

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Like some nations, psychology has in the past suffered from very artificial frontiers. Nor is it wise to define too exactly the boundaries of one's science. We are approaching a rather satisfactory conception. It is to regard as the subject matter of psychology, those processes by which the organism reacts as a whole, to the environment, or to its own conditions. This may denote a broader field than previous attempts at definition, but also implies more natural boundaries. The ambitious name of psychophysics, for example, attached itself to a problem on the relation of stimulus and sensation which has a minor rôle in the psychology of today. Similarly their predecessors spoke of " personal equation " as though it were bound up with the simple reaction time. One might recognize psychological sciences in somewhat the same way as physical sciences. Sociology and anthropology are such psychological sciences. So are the " science of human behavior " and the experimental psychology of university development, as well as comparative psychology. Psychological sciences are a natural division of biological ones.

Psychology in one of its restricted senses is the science of the behavior of those who make up our social order. For the practical purposes for which it holds itself responsible, it distinguishes good and bad behavior according to the adaptation to the surroundings. Psychology has a legitimate interest in understanding anything that brings such conduct about. Any discipline concerned with the proper control of human conduct has legitimate, not to say responsible, interest in psychology.

Medicine has long acknowledged and assumed responsibility for the behavior of most bodily processes as such. Disordered

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behavior of the organism as a whole has had relative difficulty in recognition as a medical function. This was a natural expression of the mediæval dualism of body and spirit. "More needs she the divine than the physician," is the view of Lady Macbeth's much quoted medical advisor. The so-called insanities, the most socially disturbing types of behavior disorder, have been coming under medical supervision for upwards of a century. Medical supervision of feeblemindedness, and to some extent of criminality, characterizes certain advanced communities. It is difficult to shut one's eyes to evidence of a broad current setting towards medical responsibility for the behavior not only of the liver and pancreas, but of the organism as a whole.

But owing to the same mediæval dualism of body and spirit, it came about that psychology, the discipline most directly concerned with the functioning of the organism as a whole, or the mind, whichever you prefer to call it, developed not as one of the sciences of medicine, but as a parthenogenetic offspring of the conventional mother of sciences, philosophy. Psychology thus acquired a stronger "mother-fixation" than physics, chemistry, or astronomy. Only recently has it achieved a generally acknowledged place in the family of natural sciences. Its dissociation from medicine has been comparable to that of geology. The facts would justify a situation more like that with chemistry. Chemistry denotes a field of knowledge perhaps no broader than psychology though far more developed. Medicine teaches, and contributes largely to advance, that portion which is most relevant to medicine. Assimilation of psychology has been far less ready than in the case of chemistry, though there are branches of psychology of similar significance to psychiatric problems. The result is that non-medical persons may be confronted with medical problems on a relatively modest basis of medical equipment. Medical workers are asked to meet psychiatric problems with an important part of this equipment unsupplied. This is not to the interest of science, practitioner or patient.

One should get over the practice of dissociating psychologist and physician as though they were something mutually exclusive. There have always been and will be as good psychologists in the medical profession as out of it. Both psychology and medicine will be better off if a time comes when psychologist connotes

physician not less nor more than does physiologist. This cannot be for years; things have moved too long and far in a different direction. There is a group of us not without group consciousness, whose business it is to meet certain problems that ought to be medical, and unfortunately sometimes are. These problems were perhaps discovered by medicine, in the sense that America was discovered by the Vikings. But the progress towards their solution has been very much the work of non-medical psychologists. The present dissociation is a logical result of the history of the two disciplines. I am doubtful if it should be a permanent situation. If the attitude of medicine gave no prospect of reasonable assimilation of psychology, then one could perhaps justify an effort to build up a discipline—not now existing—to enable psychology to do the best that could be done without medical affiliations. It was in this light that the matter at first presented itself to me. But when either path is open, as now seems certainly the case, it is well that psychology should weigh the issues very carefully before committing itself to an introversive development.

Medicine has "sold" itself psychology principally on the basis of the intelligence scales. Now there is a very human tendency to overlook the complications of a method none too well understood, when its results are expressed in plus or minus signs or a simple numerical term. So we are told that the only use of statistics is to refute other statistics. There is no doubt that the simple, global figure of an I. Q. often tells the data—hungry clinician somewhat more than it should. The psychologist cannot throw many stones here. But the uncritical use of psychometric methods in medicine is only less unfortunate than to ignore them altogether.

Desirous as one may be for psychology to enter the family of medical sciences, one hardly wishes to see her do so as a poor relation. Out of this has probably come the feeling that a doctoral level only should be officially recognized. Such recognition implies that one is competent to represent the psychological aspect of a problem in cases where the authority for synthesis is with medicine, or assume the authority for synthesis when it lies within psychology, as it might well do with an educational problem.

At this point one encounters another dislocation between psychology and psychologists. Psychology includes certain conceptions which have arisen under the influence of psychoanalysis, and

with which non-medical psychology has had comparatively little to do. These conceptions did not develop as a part of the traditional psychology, nor has it found them very assimilable. As we know, these formulations are exceedingly speculative, but their serviceableness has been such that they deserve to form a part in every psychological system organized on inclusive lines. Their character is such that they could not well have originated outside a medical setting. There is hardly a motive other than the desire to be relieved from suffering, which will lead to divulgence of the emotionally highly charged topics that are woven into the structure of psychoanalysis. There are non-medical psychologists who do very creditable psychoanalytic work, but without a closer contact between psychology and medicine than is yet acomplished, the material of psychoanalysis will remain largely outside the scope and control of scientific psychology. Psychiatrists in general, and our own elder statesmen, are probably ready to agree that psychoanalytic work, like hypnotism, involves risks to operator and subject that should be most reluctantly undertaken outside the setting of responsibility that medicine traditionally provides.

The place of psychoanalysis in psychiatry is for the medical man to regulate. Something might be said, however, with regard to its position among psychologists. Extreme opposition seems rarer than among physicians. Probably most of us believe that it is a useful art. A few of us, while far from committed to its teachings as such, prize it highly for a depth of view that it has aided us to achieve. In point of scientific evolution few if any of us, regard it as having passed, or as now engaged in passing, beyond the observational or " bug-hunting " stage. Its popular vogue is based mainly on the sanction it offers to erotic talk and ruminations. Ideally, it is to experimental psychology something of what the good hospital is to the good school. One renders essential service to acute individual needs. The other performs a broader and in the aggregate a greater service, if one of less imaginative appeal. To such people, psychoanalysis is worth more than psychometrics. For society in general it is doubtful if the entire structure of psychoanalysis is worth as much as the principal intelligence tests. This side of the shield is held up here, because psychoanalytic writers sometimes base their comparisons of the two fields essentially on their pathological relations. For such a purpose one

should take a broader view than is bounded by a consulting-room and a library. The influence of experimental psychology in the direction of human conduct is both the greater, and the more rapidly extending.

With regard to the exercise by psychologists of public functions, especially as concerns the commitment of feeble-minded persons, it is hard to bring oneself to believe that any non-medical person should assume full responsibility for such commitment. Every case of mental defect is potentially a medical problem. Medical education and responsibility should always be represented in such cases. It seems equally proper, however, that there should also be represented in such councils the type of experience embodied in our general Association's Section of Clinical Psychology, experience which a committing physician has not always had the opportunity to acquire. Law that one of the committing officers must have psychological training of this level, might well be advantageous in states like New York, where this type of expert knowledge is relatively available.

There is room for some solicitude about public protection against those who consider themselves psychologists seemingly with rather moderate insight into the limitations of their scientific equipment. But as in similar situations, the fundamental remedy lies with the public itself. It is proper to ask of scientific psychology that it formulate adequate standards, and make services governed by such standards reasonably available. The regulation of Consulting Psychologists by the General Association, and the Psychological Corporation, are moves in this direction. The ultimate responsibility for public protection rests with the public.

The doctor-of-philosophical setting of psychology attaches special interest to codes that bring this issue into the practice of medicine laws. The issue is rich in casuistry. At least it is better to have people surprised that you haven't an M. D. than that you have. The assumption that a doctoral individual working in a clinical setting must be an M. D. is so deeprooted that the most conscientious of us fall easily into a rôle of *médecin malgrè lui.*

Beyond the avoidance of wilful deception it would seem that the responsibility for this distinction could rest with society. It is but academic accident that has thus classified us as doctors with physicians, divines, osteopaths, veterinarians and philanthropists,

rather than with lawyers and engineers as plain mister, or as professors with philologers and tattoo artists. That it makes their work more effective is fair reason for applying the doctorate, in a medical sense, to persons who are candidates for the medical degree, and only the extremest among physicians asks for its discontinuance by psychologists. More real objection is not against the designation of doctor, but against the vagueness of what this doctor means. Ph. D. is no evidence of any training in the psychology with real medical contacts.

We are at a rather critical stage in the development of medico-psychological relationships. The next few years will weigh heavily in determining whether clinical psychology shall give rise to an independent group in quasi-rivalry to the physicians, or find a dominion status in the family of medical sciences. The former event would seem a precipitation rather than a solution, a regression indeed. Perhaps one sees most broadly when one focuses at a distance, and looks beyond personalities to the terms of psychology and medicine. Surely it will be best for both when each learns with the most freedom from the other. In general the gains of science are gains of the workers in that science as well as of society.

The failure of sciences with so much in common as those of psychology and medicine to amalgamate would not be a reassuring symptom among the complicated conditions that society faces to-day. Medicine is the greatest human discipline under scientific domination. Psychology is the organized study of human behavior. Both are members of a house that should not be divided against itself. Science itself has yet to be "sold" to humanity. Perhaps the average man has an inherent preference for social control by hurrah. He is at least entitled to a fair choice. It is not a new sentiment that the future of civilization rests upon science taking the helm where politicians fail and even the older religions seem to be losing hold. One of its best expressions came in calmer days than these, from an early work of the man who has made famous the name more obscurely carried by the present writer. Is it not interesting, by the way, that H. G. Wells published in his early days vision after vision of the future, and spends his later ones compiling the survey of the past? As far back as

1900, his psychophysician of centuries hence admonished the wreck of a decadent captain of industry in these terms:

> You see . . . . from one point of view people with imaginations and passions like yours have to go—they have to go . . . . Die out. It's an eddy . . . . We get on with the research, you know, we give advice when other people have the sense to ask for it. And we bide our time . . . . We know enough now to know we don't know enough yet. But the time is coming, all the same. *You* won't see the time. But between ourselves, you rich men and party bosses, with your natural play of the passions and patriotism and religion and so forth, have made rather a mess of things, haven't you? Some of us have a sort of fancy that in time we may know enough to take over a little more than the ventilation and the drains. Knowledge keeps on piling up, you know. And there's not the slightest hurry for a generation or so. Some day—some day men will live in a different way.

As to the bearing of such a homily on our own problems. The support of psychology belongs to any group of sciences according as it is able to carry scientific discipline into the affairs of men. As such, not a little share of our science belongs to medicine. As to the technique of infiltrating psychology into medical education opinion inclines to premedical training for the general practitioner, and graduate training for the specialist. The part that psychology has in industry would seem assimilable into the medical developments in industrial hygiene.

Thus the most hopeful outlook seems to be towards a fusion of medical and psychological sciences into the best equipment for handling adjustment problems of the human organism as a whole. Medicine and psychology together are a large order, and of course there are limits to the training the human mind can or should assimilate. Specialization is a partial answer, and another is the truism that it is not how much you know but what you know and how you use it. It has been done before, "and then some" by an intellectual mastodon among our colleagues who dwelt in the seclusion of a small middle western college some 50 years ago. We all remember the courtesy of the famous jurist who gave his seat to three women. This colleague of ours held the seat of learning for as many professors. To support the bulk of his vast and single intellect, his institution accorded him the chairs of "phrenology, penmanship and hygiene."

OBSERVATIONS OF A JUVENILE COURT PSYCHIATRIST.*

By O. G. WIEDMAN, M. D., Hartford, Conn.

The constantly increasing number of juvenile courts with court clinics, and the appeal of many more for such clinical facilities may well be taken as an index of the proven value of psychiatric methods of procedure in the field of juvenile delinquency. Because psychiatry is personal medicine the psychiatrist has influenced the social court in placing purely legal considerations secondary to the needs of the individual. In juvenile court procedure we anticipate that the judge will desire to know what there is he can do for the child, not to him.

From the beginning of my own psychiatric work in connection with a juvenile court I have been impressed by the numerous and varied opportunities such a position affords to broadcast and more firmly establish psychiatric viewpoints. The court psychiatrist finds that he makes contact with several groups of individuals in the routine performance of his duties, each of importance and each having its own problems and needs. For my own convenience I classify them as follows:

1. The individual delinquent group.

2. The family group, represented by parents, brothers, sisters, and more distant relatives or surrogates.

3. The legal group, represented by the judges, probation officers, and other court personnel.

4. The institutions and agencies group, represented by officials and workers of such institutions and agencies.

Since January 1, 1921, the law of the State of Connecticut gives to the juvenile court "exclusive original jurisdiction over all proceedings concerning uncared-for, neglected, dependent, and delin-

* Read at the seventy-eighth annual meeting of The American Psychiatric Association, Quebec, Canada, June 6, 7, 8, 9, 1922.

quent children within the territory over which their respective jurisdictions extend, except in matters of guardianship and adoption and all other matters affecting property rights of any child over which the probate court has jurisdiction."[1] In this discussion I have not considered any group except the delinquent. The law of Connecticut defines a child as "any person under sixteen years of age,"[2] and a delinquent child as one who "(a) violates any law of the state or local ordinance, or (b) is habitually truant, incorrigible or knowingly or wilfully associates with vicious, criminal or immoral persons, or (c) uses vile, indecent, or profane language, or is guilty of indecent or immoral conduct, or (d) is growing up in idleness, ignorance or vice, or (e) absents himself from home without just cause or the consent of his parents or wanders about at night-time without any lawful purpose or occupation, or (f) knowingly and wilfully engages in any practice, employment or occupation prejudicial to his normal development, physically, mentally or morally."[3] As the boy is father to the man, so the adult criminal is what the juvenile delinquent was, and the diversity of complaints under which a child may be brought within the jurisdiction of a juvenile court are those delinquencies so consistently found at the beginning of criminal careers.

The law has turned to psychiatrists for assistance in the study and treatment of conduct disorders, hoping thereby to prevent, cure, or ameliorate criminal tendencies. The outlook for a successful accomplishment of this task is certainly improved by the fact that we are dealing with children still in a plastic state—mentally, morally, and physically, and who respond much more readily than adults to therapeutic measures directed toward readjustment and reformation.

The examination of the delinquent I regard as a medical procedure consisting of physical, mental, neurological, psychological, and social examinations, the ensemble being a summary containing the data pertinent to the case. The original copy of this summary is the report rendered by the psychiatrist to the judge referring the child and is an endeavor to analyze the individual and the cause or

[1] P. A. Conn. 1921, Chapt. 336, Sec. 3.
[2] P. A. Conn. 1921, Chapt. 336, Sec. 1.
[3] *Idem.*

causes of his delinquency, with an opinion as to prognosis and treatment. The amount of time required to gather together material for a comprehensive report may be several hours or several days, but the court is usually quite ready to cooperate in the matter of time, and by coordination of examination procedures there need be no unusual delay in the hearing of the case.

How and by whom data necessary to compile a summary shall be obtained is a matter of considerable importance. I have stated that I regard the examination of the delinquent as a medical procedure. It is also a new field of psychiatry and at present, too, a field of conflict between psychiatrists and psychologists. After the battle clouds have cleared it will probably be found that both groups must work together if the best interests of the patient himself are to be conserved. My own feeling in the matter is that psychiatrists should have direction of the work and receive the assistance of psychologists and psychiatric social workers. The elimination of any group or element tending to give a more accurate and scientific presentation of facts is to be deplored.

The diagnostic classification of juvenile delinquents into groups labeled with a psychiatric term is interesting and valuable but it does not meet the needs of the law, nor does it make for anything like a complete understanding of delinquency. The cardinal reason for this is the fact that in the examination of a large number of first offenders among children one need not expect to find over 33 per cent with mental defect or aberration. This leaves the majority as mentally normal, a situation which forces an intensive study of causations and personality. It may be fortunate that such a large percentage of these first offenders are diagnosed as normal for it effectively counteracts any tendency on the part of the psychiatrist to be satisfied with a cross section of the case.

Experience has shown that the psychiatric method of study of an individual tends to demonstrate at an early age mental conditions such as feeble-mindedness, mental inferiority, psychopathic states, the psychoneuroses, and psychoses, and earlier medico-legal work in the children's court was prompted by a desire to secure adequate and just treatment for offenders suffering from such disorders. The evolution of the juvenile court idea compels us, as psychiatrists, to go much further to-day in the search for facts to assist in

explaining conduct disorders. As a minimum we require knowledge of the heredity and environment, mental capacity and content, special abilities and weaknesses, personality and characteristics. Knowing these essentials we are in a position to offer constructive advice regarding the readjustment period in the child's life which is to follow the court's action.

The juvenile court then is a court of equity trying to learn the needs of each child coming before it and attempting to meet those needs with benefit to the child, whose future usefulness to society may perhaps be made or marred by the judicial decision. The psychiatrist in giving his opinion as to prognosis and treatment must have an accurate idea as to how and where the treatment recommended can best be instituted and carried on. This implies not alone an understanding of the needs of the individual but also a working knowledge of state laws concerning juveniles, the character, equipment, and qualifications of state and private corrective institutions, the many ramifications of the probation system, and the private organizations in the community who can be called upon for aid.

Since the development of the probation system it is only the exceptional first offender who is forthwith committed to an institution. It may well happen that the nature of the offense or the character of the home indicates prompt institutionalization for the child's protection, but the larger and more important field lies in efforts at readjustment without removal of the child from the home. From a psychiatric standpoint the home and family of the delinquent are worth careful study and consideration. Competent parents and a wholesome home environment are positive and potent factors in the prevention of delinquency. In a group of our own cases only 28 per cent were considered as having average normal home life with adequate parental supervision and care.

It is of significance to note that children from good homes are more apt to make their first appearance in the juvenile court after the age of 12, and this usually indicates factors outside the home as instrumental in the evolution of delinquent tendencies.

The proportion of delinquents living under abnormal home conditions is so large as to establish in my own mind a definite relationship between the character of the home and the likelihood of a de-

linquent career. In the 72 per cent of homes considered by us to be abnormal, divorce, death of one or both parents, desertion, feeble-mindedness, insanity, alcoholism, criminality, dishonesty, sexual immorality, cruelty, neglect, poverty, avarice, and ignorance, alone or in varying combinations, formed the bulk of the deviations from normal.

Contact with the officials of the court tends to a better understanding on the part of the psychiatrist of their problems and the psychiatric influence on the court has been to lessen the tendency to ritualistic treatment of offenders and more consideration for the individual as a human being out of normal adjustment. Perhaps it is too much to expect of members of the legal profession that they should be able to step from the criminal bench into the juvenile court on the same day and render efficient service in both, but that is what they are and will be called upon to do in the vast majority of instances, for, except in metropolitan centers, the judge of the city, borough, or town court also hears the juvenile cases. This may not be an ideal arrangement, but where the judge takes his juvenile court work seriously and desires to render public service the end results produced by his court will be far reaching. The most successful juvenile court judges are those who approach their duties without their judicial temperament, but with a sympathetic understanding of child life and the elements in it that condition conduct.

The task of handling children placed on probation by the court falls to the probation officers. They have many other duties but the most important is the endeavor to give constructive assistance in readjusting the child and building up his character. The state is the ultimate parent of the child and the probation officer represents the state. To accomplish the best aims of the probation system those in charge of it must understand children in general and the individual in particular. Here again the psychiatric method of life study has been of value as a study of the psychistrist's report to the court gives to the probation officers at the outset a fund of information and a specific aim.

The institutions and agencies to which the court turns in the treatment of children are of such worth that without their cooperation much effort would be wasted. Child welfare organizations

have increased in number and efficiency during the past few years and much of that increased efficiency has resulted from more rational attempts to direct human activities through individualization. State corrective institutions are beginning to think about the needs of the individual and the public schools, the church, the Boy Scouts, Girl Scouts, Campfire Girls, Big Brother and Big Sister organizations and numerous other public and private agencies are likewise bending their efforts more and more upon the individual. All this corresponds with the advances made by psychiatry and would seem to show a growing appreciation of the increased civic usefulness of the child trained to desire physical, mental, and social efficiency.

The immediate success of the court psychiatrist will be determined by his ability to display practical common sense in his recommendations for the disposition or treatment of each case. In spite of the increasing number of official and voluntary social agencies available, there remain many gaps in our facilities for the ideal handling of all individual cases. The chief test of the psychiatrist, as well as of the probation system, lies in deciding whether the practical results of intensive effort with an individual will repay their disproportionate cost or whether the individual must not take his chances under group treatment. The chief danger to which the probation system is exposed is that theory and sentiment may tempt it to such a degree of individualization that the machinery will become too bulky and too costly for the tolerance of the community. When the work has a certain mass it must be run by a formula, in which flexibility can be permitted only so far as it is controlled by practical judgment. If the probation officer cannot repair the defects of the home, he may try a substitute home; if this is impracticable or unsuccessful, the next step is a custodial institution; if this fails, then a corrective or reformatory institution must be used. An important service of the psychiatrist is to save wasteful efforts in home environment and to save children wherever possible from institutional treatment.

It is quite as easy to be carried away by the concept of reformation as it is to succumb to a lethargic system of institutional disposition and it is the task and privilege of psychiatry to show the limits of the one and the errors of the other, and at the same time

for the psychiatrist to show his own capacity for adjustment by coordinating forces for the benefit of the individual and of the state while indicating the direction in which these corrective forces may be improved.

DISCUSSION.

DR. TERHUNE.—Mr. President, I have been greatly impressed by Dr. Wiedman's splendid report and I think it shows a very high sense of community responsibility. Dr. Wiedman has been making bricks without straw for some years and he has helped the rest of us in Connecticut by so doing. I think that within a short time all of the large centers in Connecticut will be undertaking the same work due to his ability in pointing the way. It seeems to me that this work Dr. Wiedman has described is a part of the three steps in psychiatry: That the first step was poor community care of patients, which was a failure; and the second step was hospital care by patients, and the third step, it seems to me, is a combination of hospital and community care. I would like to ask Dr. Wiedman a question. Dr. Wiedman, do you make recommendations to the court for the disposition of the case and do you back that up with your findings, or do you present your findings and let the court make the decision?

DR. MITCHELL.—The development of juvenile courts in our larger cities with the employment of psychiatric or psychological assistance has been so general that such communities are commonly supplied with the advice so much needed in disposing of juvenile delinquents.

In the country districts, there is much need of this advice, which cannot be so easily secured as in the cities. Here the hospital for mental diseases has an opportunity of rendering such aid to the district which it serves either by maintaining clinics or receiving such delinquents for the study and observation required for the formation of a report. The Warren Hospital serves 14 counties, any of which can send children to the hospital under provision of Pennsylvania voluntary commitment for study and report to courts, schools, nursing association or other social agencies. We consider such contributions an important part of the service which we give the community, and often we are called upon to consider such cases as Dr. Wiedman has written about.

We endeavor to secure family and personal history in detail, to ascertain physical condition with such laboratory assistance as indicated, the facts necessary for an estimate of the child's mental development and a period of observation sufficiently prolonged to form some conception of the child's conduct and reactions under the new environment. Often we are forced to believe that the behavioristic reactions reported in the history are more probably the results of faulty parental control and home environment than innate depravity of the child.

I should like to hear from Dr. Wiedman in closing, what reliance he places in formulating his report to the court, upon the many psychometric tests proposed for estimating mentality.

DR. WIEDMAN.—Mr. President, in answer to Dr. Terhune's question as to the method of reporting and recommendation. The recommendation is embodied in the report; the psychiatrist is not privileged to make anything more than a report or a recommendation. However, if there is any question as to what the court may do, the matter is made one of personal contact. When the work advances further the psychiatrist will undoubtedly sit with the court at each session. In regard to the use of psychometric tests, I am still a student in the field of juvenile delinquency and don't think I can give a valuable answer as to their efficiency, but I must regard them as the internist regards X-ray pictures.

THE CONSTITUTIONAL PSYCHOPATHIC INFERIOR.

A Problem in Diagnosis.*

By ALICE E. JOHNSON, M. D., Phila., Pa.,
Psychiatrist in the Municipal Court.

In most psychiatric clinics there is a mass of diagnostic left-overs after the clear-cut and definite cases are placed in their accepted pigeon holes. This mass is lumped together, thrown into the " rag bag " and usually labeled psychopathic personalities. To all clinicians this arrangement is very unsatisfactory both because it is slovenly and because it tends to establish a static condition where further and active interest is discouraged.

Using the material in a large clinic where the majority of cases appear to fall into this indefinite group, I have made an effort to more accurately classify these patients and see if there is not some mark by which they may be distinguished.

Is there not some basic characteristic present in some and absent in others? In what way does each deviate from the normal? What, indeed, is the test of normality?

Since we have as yet no defined structural pathology in such cases we must study the subject on the basis of function. Now we know it is the *personality* that is at fault here, and the demand which is made on personality is adjustability. We may then say that a normal personality is one which is adjustable to the environment.

This conception gives room for the generally accepted idea that an individual may be normal in one environment and not in another, that he can carry a certain load but has a limit beyond which he cannot go. It also explains the fact that there is no clear line between normal and abnormal, while it is true that certain things are definitely on one side or the other of that line. All patients labeled psychopathic personality are, then, obviously, unadjustable under ordinary circumstances. The question at once arises, where-

* Read before the Philadelphia Psychiatric Society, May 12, 1922.

in lies this unadjustability? Here we find the beginning of a line of cleavage in the mass. They are found to have different basic reasons for failure. Failure is a *symptom*. This symptom is caused by different things. Pathology, even functional pathology, is a better basis for classification than symptomatology. Accordingly we have here different diseases under the same label. If we go deep enough in our analysis, I think we will find that there are two conditions in this mass, and that in relation to pathology they are exactly opposite.

Pursuing the inquiry, the next question is, What determines adjustability in the organism? What is the basic quality through which an individual becomes socialized?

A young child's reaction to his environment is determined by that quality in himself that is manifest through pain. The possibility of pain is his original life saving device. The experience of pain and the remembrance of the sensation produces *fear*. The burnt child dreads the fire because he remembers the pain of the experience. Although the basic emotion in an individual is, probably, some kind of desire, the basic reaction is determined by the amount of pain which is experienced in trying to satisfy that desire. Fear, then, seems to be the answer to our last question; or to go back one step farther, it is the ability to remember pain. It doesn't matter whether it is a conscious memory or whether it is a conditioned reflex, or unconscious memory. A good working name for the quality may be moral impressionability.

Moral impressionability can have three relations to adjustability. It can be too weak, or too strong, or just about equal to the need.

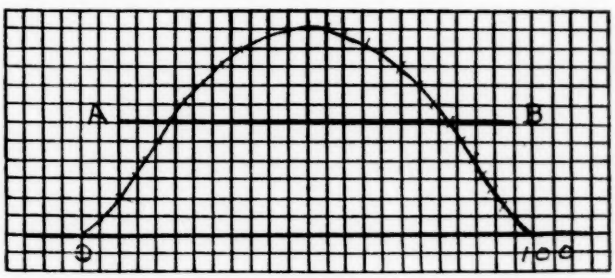
In the patients I have studied the actual situation can be shown by a curved line graded from zero to 100. Draw a line *AB*, cutting off a sector of the curve.

Each gradation represents an increment of this quality called moral impressionability. Those individuals in whom the quality is present in too small a degree for adjustability will fall within the space *OA*. From *A* to *B* are those in whom the quality is sufficient to enable them to make a fair adjustment in all ordinary circumstances. Some of these will be easy going, cheerful, rather uncritical people; others will tend to exactness of conduct, demanding a good deal of themselves and of others, and playing safe

wherever possible. But all are "normal," because all "get along" on the plane where they are placed by circumstances.

Passing around the curve, increasing gradually the fear sense, we fall into the third group, *B* to 100 on the scheme. These people are too sensitive to impressions. They remember too well. Their reflexes become conditioned too easily. They are continually inhibited in their efforts to adjust to their present environment by their remembrance of the past and consequent fear of the future.

It is obviously from among the individuals placed at the two ends of my curved line—those below the *AB* normal line, that the constitutional psychopathic inferior or psychopathic personality group is filled. If my grouping is correct, it is seen at once that we are dealing with two opposite conditions.



It is this first group *O* to *A*, to which I think the designation constitutional psychopathic inferior should be exclusively applied. That is a better name than psychopathic personality, because it means something definite, and I think we are dealing with a definite defect in these cases. If psychopathic personality means anything it must mean all people who have a tendency to any sort of mental or *personality* disease. It is too inclusive a term to be useful at the present time. Neither of these names is entirely satisfactory, and no doubt some other designation will eventually be adopted.

That our constitutional psychopathic inferiors constitute a separate group will not be denied by workers who deal with the socially defective. Most social workers, custodians of criminals, and those who work in correctional institutions of all sorts will readily

believe in the natural moral unimpressionability of certain of their charges.

The condition is seen in very young children and in all ages thereafter. These people come from every class of society; they may have a higher or lower grade of intellectual ability, may be organically defective or perfect specimens of physical development. In manner they are often pleasant and agreeable on first appearance. Except when frustrated in some desire they are good natured enough. But they are bad citizens and they do not improve. They forget the past and think hopefully or not at all of the future. In short, they are motivated almost entirely by the desire of the moment. Their inhibitions are weak and evanescent, although impulses are not apt to be strong, for their energy, being constantly discharged, does not become exaggerated by repression and summation. They, of course, know no fear, and constantly rush in, often enough "where angels fear to tread." They have only such impressionability as that which I call "the tennis ball type," which rebounds the moment pressure is removed. Lacking the power to apprehend relations, they naturally have little true self-consciousness.

Returning to the other end of the curve, we find a large number of people of a different kind who have been classified with the constitutional psychopathic inferiors. On superficial examination they frequently seem to belong in this group. They are equally unadjustable with the others, and are always in trouble. They are never comfortable except as they can produce an illusion of safety by some of the many methods devised for this purpose. They see lions in the way, and they flee when no man pursueth. All of these people are psychoneurotics.

Psychoneurotic is a name usually reserved for those safety-seeking individuals whose first defenses have broken down and who have developed others in the form of certain fairly definite disease symptoms. But when we accept the pathological process as the basis for diagnosis, we see that the difference is only one of degree. The process is the same in a patient who is unable to work because of obsessive phobias and one who is merely too self-effacing for success.

Although differing so greatly in cause, the diagnosis between these two conditions is not always easy to make. It cannot be made

on symptoms alone. The conduct of the two classes may be very much alike. (That I conceive to be the reason why they have been classed together.) There is hardly a breach of decorum or of law of which a constitutional psychopathic inferior will be guilty which is not also to be found among psychoneurotics. But if we go deep enough into the causes of this conduct the difference will be apparent.

There are some practical advantages in making the division here indicated. The object of diagnosis everywhere is rational treatment. Our therapy in unadjustability is guess work and practically useless so long as we take no account of the specific reason for each individual's unfitness.

The psychoneuroses are, at least theoretically, preventable or curable, because here we have the quality on which all teaching, all training, all reconditioning depends. If therapy often fails in fact, it is because of the break down of our technique. One of the causes of this failure in the past has been that such technique as we have developed has too often been applied to undifferentiated conditions. Going at it in a half-hearted way the physician becomes discouraged and begins to doubt the value of his method. I maintain that it is impossible for any one to make a prolonged and vigorous effort to cure a patient whom he calls a psychopathic personality! And yet it is true that many curable cases have been called by that name.

The constitutional psychopathic inferior cannot be cured, any more than can the feebleminded, and for a similar reason. This defect is inborn, and not acquired through any reaction. Successful work with the mentally defective indicates the way for our therapy in these cases also. Society recognized the existence of the feebleminded as a class, and is making a slowly increasing effort to deal with the problem. There is a still more urgent social problem in the constitutional psychopathic inferior, and only a very few people recognize its existence. This is preeminently a problem for the state, but it is the psychiatrist who must point the way. And psychiatrists, although familiar with the term, do not know what a constitutional psychopathic inferior is!

All over the world there is a growing interest in the broader social problems. Practical sociology, social hygiene, mental hy-

giene, juvenile courts, penology—all these wait on a more scientific knowledge of the motives of conduct. The psychiatrist, working at the heart of the problem, can make a definite contribution to this effort by clearing up and sharply differentiating that mass of misfits which he has been content so long to call psychopathic personalities.

CATATONIC DEMENTIA PRÆCOX; PHYSIOTHERAPEUTICS, AND RESULTS OBTAINED IN A SERIES OF TWENTY CASES.*

By DANIEL C. MAIN, M. D.

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Our conceptions of the rôle which physical therapy is able to play in mental therapy are gradually becoming delimited. On the one hand we have the ultra-conservatism, which holds that a patient should work for the benefit of the hospital, but which cannot conceive of mental improvement attainable by such means, and on the other hand the loosely founded optimism of lay enthusiasts who look upon the achievement of getting a catatonic præcox to work as being substantially a cure of the mental condition.

Now, indiscriminate as has been our classification of præcox in the past and nebulous as some of our ideas about it undoubtedly are at present, at least we are unable to find ourselves in consonance with either one of these views. To discuss the latter first, we know, if we know anything at all about præcox, that it is something more than the manifestation of a group of more or less bizarre symptoms, that it is a regressive process resulting in a rather profound mal-adjustment at the psychobiological level. It is not easy to conceive that a patient who has regressed to such low levels that he is dwelling again in early race-memories should be cured by learning to weave a basket or carve a wooden toy. What, then, can we expect of occupational therapy in these patients?

We can expect benefit to the patient in several ways.

A momentary contrasting of the old-time asylum—a vast caravansary where were housed and fed the state's dependents—and the modern hospital for the mentally ill, will be illuminating. The ideal in general in the old asylum was to make the patient as comfortable and contented as possible. The noisy and the untidy were

* Read at the seventy-eighth annual meeting of The American Psychiatric Association, Quebec, Canada, June 6, 7, 8, 9, 1922.

segregated, food and shelter were provided and kept up to standard. The old-time patriarchal superintendent knew his patients by name, inquired after their health when he encountered them on the ward, and listened to their complaints; the modern psychiatrist, in addition to this, tries to find out what was the original make-up of the individual, what were his character traits and how came his mal-adjustments to express themselves in a psychosis. Having estimated these things to the best of his ability, his aim is to help the patient to readjust. Occupation is one means by which his libido may be withdrawn from introspection and find attachments in the outside world.

But when a hospital has provided a teacher who succeeds in getting a squad of patients to work at something, basket-making, rug-weaving or what not, the problem is by no means solved; this is, in fact, only a crude approach to a solution. There must be diverse kinds of occupations which offer the patient a wide selection, from clerical work necessitating concentration and intellectual powers down to the simplest sort of manual labor. In short, the hospital should be a microcosm offering the patient as wide a choice of careers as the outside world. The individual himself will then be enabled to find the level at which he can get into touch with reality and this will often be found to be far different from the one with which he was familiar on the outside.

The selection of an occupation can by no means be done offhand, but a few general rules will apply. Thus it may be laid down that the occupation must be congenial and yet not one with which he has been so familiar that it would seem but a continuation of his former life. Above all, dementia præcox patients, with their natural tendency to introspection and phantasy, should not be given work to do the performance of which becomes automatic with proficiency. How common it used to be to see a female catatonic plying her fingers all day busily at a piece of embroidery while her brain was still busier weaving long phantasies.

If nothing more were accomplished by occupational therapy, it would still provide an avenue of escape from "institutionalism" in its worst phases, that is, profound inertia, mental deterioration, personal untidiness, and all that train of degenerative traits which are to be found in any chronic ward. It is sad to reflect that many patients who are now for all practical purposes hopeless and

helpless, might have reached some useful intramural level by occupational therapy years ago. I have in mind a patient who has been in the hospital about twelve years and has always been considered a general nuisance. He has indulged in homosexual practices, made more or less serious attempts at suicide and self-mutilation, had parole a dozen times and lost it, been boisterous, noisy, untidy, complaining, abusive, threatening, and who has in short, nearly exhausted the gamut of undesirable behavior. Lately he has been put at so simple a job as painting the fences in various parts of the hospital grounds. He takes great pride in this work, which he does comparatively well, and often requests physicians as they are passing to come and inspect it. He told me the other day, "Doctor, if someone had given me this work to do ten years ago I wouldn't have gotten into all the trouble I have, and what's more, I'd have been out of here and making my own living."

However exaggerated, there is something in this statement. There is no doubt that this patient, like many others who have proved a constant source of irritation to hospital officials, might have had his energies directed into some constructive channel and thus made an adjustment which would have solved his own problem and which certainly would have benefited the hospital community itself.

A question which naturally arises in connection with occupational training is: Can the mental patient be taught a trade which will render him self-supporting on the outside? The answer to this must be generally in the negative, in my opinion. The type of mental disorder which reaches the commitment stage is usually pretty well handicapped in various ways. Exceptions may be found in the so-called psychopathic hospitals and occasionally in the receiving ward of the state hospital, and there may be found types of patients who can be instructed in lucrative callings to the extent that in the event of discharge from the hospital some degree of earning capacity may enable them to lighten the burden of their relatives. And, of course, there are always those patients who are forced to abandon an occupation temporarily on account of an attack of, say, manic depressive psychosis, who upon recovery may be able to resume at the former level, even though during their stay in the hospital it is found advisable to employ them at something far different from their ordinary vocation, a manual

job instead of a clerical one, and so on. But it would seem at present that our efforts should be directed to occupational therapy as a means of helping the patient to adjust in the hospital, of directing his energies into purposeful and benignant activities and by extroverting his attention from his preoccupation with his unconscious activities put him into touch again with reality.

A word as to the type of instructor.

Perhaps nowhere is a suitable temperament more important. It is not enough for the instructor to be proficient in his own particular line. He must, of course, be well versed in it, a truism applicable to all teachers. In many cases his method of instruction must for a time be limited to performing the work in the presence of the pupil or indicating by signs what is expected of him. He may find that his oral instructions are completely disregarded. He must contend with indifference, ingratitude, attempts to destroy material and tools.

He must be on the alert to discover natural ability as well as ineptitude, and have sufficient judgment to recommend a change in work if indicated. He must have infinite patience to bear with what often seems to him to be wilful mistakes and obstinate stupidity and he must be quick to encourage the signs of awakening interest in a hitherto indifferent pupil. The question of restricting loafing on the job will come up and the instructor must decide whether this is natural fatigue, inability due to the mental disorder or laziness which it would be unwise to encourage.

For illustration, I have selected twenty cases of catatonic dementia præcox. Patients of this type are always, as this audience very well knows, an acute institutional problem, owing to the comparatively high incidence of the disease and to the type of reaction shown.

It would be entirely gratuitous here to dwell upon the diagnosis and symptomatology of catatonic dementia præcox. The bizarre delusional ideas, the negativism, the muscular tensions, the untidiness, the refusal to cooperate, the wild excitement and the deep stupors, all make this disease seem an especially barren field for the exercise of occupational therapy. In fact, the routine of treatment in the past has been to shut them in a room when they were excited, feed them when they were stuporous and thank God and

discharge them when they recovered, which some of them did for no assignable reason.

In view, then, of the obvious difficulties of dealing with this type of patient, it is especially gratifying to be able to show you this series of twenty catatonic patients and the results obtained by occupational therapy. I shall present brief histories, with an outline of the methods employed and the results obtained in each case.

As the first fifteen patients in this series worked in one shop and the first three to six weeks' work in this shop is practically the same for all patients one outline covering this period will serve for all, the closer study beginning at the end of this variable period when the patient begins to show an inclination to follow certain lines of shop work. This introductory period is spent in outlining patterns on wood for more advanced workers to saw out and after the patient has become fairly proficient at this he is given some of these sawed out parts of animals, etc., to sandpaper and bore holes in where they are to be jointed. He is next given a saw or plane to work with and if he continues to improve he is soon allowed to use a scroll saw or turning lathe or to build more complicated things, as tables, lamp stands, etc.

CASE 1.—Philippino, age 26; no education; hat weaver by occupation; over two years in the navy. Admitted to the hospital in May, 1920, with a history of having six weeks previously begun to show the usual symptoms of catatonic præcox. In December of 1920, while he had shown little, if any, improvement, he was one of a group picked to work in one of the woodworking shops, where, by the way, he still works. After the usual preliminary period he was given a hand scroll saw to work with, the instructor not feeling that he wanted to trust him quite yet on a foot power saw. For several weeks he worked only when the instructor stood by him. The first time he was heard to utter a sound was much later when he was given a power lathe to operate. The moment the machinery started he laughed outright. From this on he progressed rapidly until now he is doing the highest grade of cabinet work and has shown a high degree of originality and initiative. Though there have been several other Philippinos in the shop he has never been heard to speak a word.

CASE 2.—Philippino, aged 23; education, first year of high school; occupation, student; one year in the navy. Admitted to the hospital in June, 1920, in a catatonic excitement which continued, with remissions, for over a year. He then had a stuporous attack and on recovery from this he was taken to the shop in December, 1921. For some time he stood around, mute and negativistic, but after a time went to work. At the present time he requires no guidance except in new work and he is doing

excellent work. He talks to others of his race, but refuses to speak English.

CASE 3.—Mexican, age 26; no education; occupation, laborer. Was in the military service two years before admission to the hospital in July, 1920. Six months after admission he had shown a little improvement and was taken to the shop in February, 1921. Because of his negativism he was hard to handle and he did not neglect every chance he had to elope. Beyond the introductory period he spoiled everything he got his hands on, planing the wood too thin, cutting it off too short, etc., for a considerable period, but, while he has improved very much in the quality of his work it is limited to the use of the scroll saw, the making of patterns, etc. When using the scroll saw he is especially accurate and rapid now.

CASE 4.—Polish, age 36; no education; laborer by occupation. Admitted to the hospital in June, 1919, after one year overseas. We have no mental history previous to admission but on admission he was catatonic, and was cared for in bed, tube fed, etc., for nearly eighteen months, and in fact was practically taken out of bed to go to the shop. He has been in the shop now for about eighteen months and is doing work that would be a credit to any cabinet maker. This patient has been known to speak only twice since admission.

CASE 5.—Polish, age 27; eighth grade education; electrician's helper. Was overseas one year. Admitted to St. Elizabeth's August, 1920, eight months after onset of a catatonic excitement. In September, 1921, he went to the shop, the excitement having somewhat subsided, though he was still very active. When he first got to the stage where he could use the foot power scroll saw he had to be held on the seat. He was gradually improved and now he does very fast and accurate work.

CASE 6.—Polish, age 26; no education; occupation, laborer. First symptoms developed while overseas and he was admitted to the hospital eight months after their onset. On admission in January, 1920, he was in a catatonic excitement which persisted more or less actively up to the time he entered the shop in December, 1920. For several months his progress was very slow but in time he developed into a satisfactory workman and was discharged from the hospital in August, 1921.

CASE 7.—German-American, age 22; education, high school; occupation, midshipman. Admitted to the hospital in October, 1919, at which time he was in a catatonic stupor. He soon cleared up a little and was taken to the shop in December, where he rapidly improved, taking a great deal of interest in his work and was discharged from the hospital in April, 1920.

CASE 8.—American Hebrew, age 20; high school and business school education; occupation, bookkeeper. Admitted to the hospital in July, 1920, after one year of service in the navy and six weeks after the first symptoms of mental illness appeared. On admission he was in a mild stupor which

persisted for about four months. He entered the shop in July, 1921, and for some time had to be led to and from the ward, and it was necessary to force him to sit down at the bench. When sandpapering he would wear the part he was working on entirely away if not stopped. When improvement started it was so rapid he was considered fit for higher work than this shop had to offer, but in a few days he wanted to come back. He was discharged from the hospital in December, 1921.

CASE 9.—American, age 20; high school student. Admitted to the hospital in November, 1919, after eight months in the navy and three weeks after the mental symptoms first appeared. This boy's condition was such that nothing was tried with him until December, 1920, when the instructor saw him on the ward and asked that he be sent to the shop. At first he was very slow with everything but gradually he became more interested and like Case 1 he developed into a rapid and accurate workman, building tables, lamp stands, step ladders, etc. He was discharged from the hospital in July, 1921.

CASE 10.—American, age 26; education, eighth grade; occupation, electrician. This patient was admitted to the hospital in May, 1920, two weeks after the onset of his disease. He was overseas one and one-half years. In September he was taken to the shop. For several weeks he did very little, remaining mute and negativistic. In fact, he did not talk for some time after he was doing fair work. Gradually he became more and more interested and when discharged from the hospital in April, 1921, was doing most satisfactory cabinet work.

CASE 11.—Spanish-American, age 22; fourth grade education; occupation, miner. Admitted to the hospital in February, 1920, five weeks after the onset of his disease. Had been in the military service for two years. A month after admission he was taken to the shop and began to improve immediately. Was at first afraid to do any complicated work, but after seeing the more advanced pupils at work he asked for more intricate work and soon evidenced a considerable degree of originality. He was discharged from the hospital in May, 1920.

CASE 12.—Italian-American, age 26; seventh grade education; occupation, laborer. Admitted to the hospital in August, 1917, and to the shop in December, 1921, after about four years of mutism, tube feeding, untidiness, etc. Except for the duration of the illness this patient was very similar to the one discussed under Case 8. At first he was very slow and inaccurate, but he has gradually improved till now he is doing very satisfactory work.

CASE 13.—Hawaiian-Chinaman, age 35; education, none, occupation, cook. Admitted to the hospital in March, 1920, and to the shop in August. At first this man seemed hopeless on account of his mutism and failure to comprehend what was wanted. There was no language difficulty.

After some months he became very much interested and at the time of his discharge from the hospital in May, 1921, he was doing most excellent work.

CASE 14.—Russian, age 27; no education; occupation, steel worker. Admitted to the hospital in May, 1920, two weeks after the onset of his disease and six weeks after re-enlistment. Admitted to the shop in August, 1920, and for several weeks could not be made to do anything. Gradually, however, he began to look around and handle toys and finally was put to work. At the time of his transfer to another hospital, August, 1921, this patient had progressed well toward recovery and was doing excellent cabinet work.

CASE 15.—Canadian, age 22; sixth grade education; occupation, cook. Admitted to the hospital in October, 1921, after a few months in the military service. On admission he was a text-book catatonic. After showing a very little improvement he was taken to the shop in March of this year. Since being put to work his progress toward recovery has been rapid and he is now making excellent toys. Within the past month he has answered a few questions.

The next five patients come from another shop.

CASE 16.—Russian, age 36; no education; occupation, brass moulder. Admitted to the hospital in August, 1920, one year after being discharged from the service. Entered the shop in August, 1921, previous efforts having been made to get him to do something. After entering the shop it was some time before he would work at anything continuously. He then is noted as being painstaking and industrious, doing beautiful knotting, making key rings, girdles, etc., and taking pleasure in his work. From this work with string he went to reed work where he did some most excellent work and was later put in the toy shop here he is at present also doing excellent work.

CASE 17.—Polish, age 32; education, none; occupation, farmer. Admitted to the hospital in August, 1920, having been discharged from the army one year previously. For a year before admission and for 18 months since he has been passively negativistic, slovenly and indifferent. On admission to the shop in January of this year it was noted that there had been no change in his condition. Persistent effort finally succeeded and he began to roll carpet rags into balls. He was then taught to knot cord for fringes on rugs. From this he went on to loom weaving and brush making. His whole attitude has changed. He is clean in his habits, helps with the ward work, and is eager to go to his class.

CASE 18.—Austrian, age 28; no education; occupation, miner. Admitted to the hospital in August, 1920, having been discharged from the military service one year previously. This patient and the one just above were overseas and their psychosis evidently began there. This patient's con-

dition was similar to the one just described but he seemed a little more hopeful case than the one above for he was taken to the shop in October, 1921, at which time he had to be led to his work and back and forth to the ward. At first he was kept in class only one-half the day but when he found this out he became indignant, the first emotional reaction he had shown, and he was allowed to remain in the weaving room all day. At first the instructor had to place the shuttle in his hand and place his foot on the pedal, but he soon became interested and was able to use two shuttles. When transferred to another hospital in February of this year he was doing some most excellent work on the looms, weaving a pair of portieres in pattern weaving.

CASE 19.—American, age 29; education, eighth grade; occupation, clerk. This patient was admitted to the hospital in October, 1921, having been discharged from the service two years previously. For some time after admission he was mute, passively negativistic and untidy. He entered the shop in March of this year and for some time would only work when constantly watched. He was started in basketry and some of his first work was very crude, as he insisted that he could make his own design. Later he consented to follow the designs of others and has taken pride in his improvement. He showed some talent in drawing and was transferred to the drafting department, where he has been copysketching, which he likes very much.

CASE 20.—American, age 31; education, second year high school; occupation, clerk. Admitted to the hospital in December, 1921, suffering from a mild catatonic stupor which evidently had its inception overseas in 1918, but for which he had not been previously hospitalized. On admission he was mute, inaccessible, and showed flexibilitas and was tube-fed for some time. In March he was sent to the shop and it is noted that he was disturbed for a few days, but was soon persuaded to wind a ball of warp. From this he went to basketry, but at times would become rigid for short periods. Early in May he was sent to an agricultural class where he has shown a decided improvement.

During the time these shops have been open there has occurred no accident, and from the first the patients have been cleaner in their habits, have been quieter and have been less and less hallucinated.

DISCUSSION.

THE PRESIDENT.—The very suggestive paper by Dr. Main is before you for discussion. May I call on Dr. Ziegler, of the United States Public Health Service, to open the discussion?

DR. ZIEGLER.—This paper was particularly interesting to me, because I have been thinking considerably about occupational therapy for the past year or so. I know Dr. Main well and some of the work with his patients.

In the first place, the prognosis is better in catatonic præcox than it is in any other kind. They do recover more quickly than the other forms. The prognosis is better, but even at that, if you could hasten their recovery by something like occupational therapy, it is of undoubted value.

The second thing which I had in mind in regard to Dr. Main's paper was the fact that from a scientific standpoint his study was without control; that is, he should have taken twenty cases and given them occupational therapy, and seen what the rate of recovery was, and taken twenty, and not given them occupational therapy, and seen what the rate of recovery was with them. He might change his mind about the results of occupational therapy, but I think not.

Occupational therapy may be given for a great many reasons. Of course, the principal reason is to have the work do something for the patient, so that he will get into the work of the outside world. Probably the thing that most people think of when they speak of occupational therapy is that it gets the patient's mind off himself. The thing, which a year's intensive study of this thing leads me to believe, is that it may enable the patient to acquire very definitely valuable work habits, and also overcome defective work habits which he has acquired. I think that the subject of occupational therapy is in its embryonic stage, and as we go on and analyze the defective work habits of patients and the ways in which we may institute occupational therapy to correct these defective habits, the more value we shall realize from it.

What we must learn to do is to make occupational therapy apply to very many different jobs, as Dr. Main has indicated in his cases. This tends to wake up an individual and often allows him to learn that he has missed his entire calling, that he ought to be doing something else. I like the paper of Dr. Main because he has pointed out a few of the possibilities which need to be worked out in order to reap the therapeutic benefits that will be derived when ocupational therapy outgrows the present embryonic and somewhat formal stage in its development.

Dr. Ostrander.—May I say that in my opinion you can't treat dementia præcox or any other psychosis with occupational therapy? You treat the individual, and unless you have a director who understands that and can analyze pretty acutely the type of the individual, your occupational therapy is not worth much. I believe that to be definitely so. I have a director of recreation who is quite a student of human nature. I was very much interested one day in watching this young man in the gymnasium organizing a game of indoor baseball. He purposely took two cases of catatonic dementia præcox, put one in the pitcher's box, and one on first base, and he took a soft ball which would not hurt any one and fired it at the pitcher's head. The pitcher had to do one of two things—either dodge that ball, or catch it and go on playing. He caught the ball, he threw it at the striker, the striker got the ball and knocked it at the pitcher's feet, and he continued to remain at the box, gathered the ball and threw it to first base,

and this was repeated, and those two men continued and did the same thing again. I want to emphasize the fact that you do not treat psychosis with occupational therapy or anything else. You treat the individual.

Dr. Main.—Mr. President, no one has said anything about cures. The unread part of my paper consisted of case reports, and several of the patients studied, having made good recoveries, were so discharged.

Dr. Ziegler spoke of controls. I think controls can be found on the "back" wards of any of our hospitals.

The average præcox, of course, can just as well be employed in some department of the hospital as in the department of occupational therapy. Some enthusiasts, however, insist that work in a hospital shop is not of therapeutic benefit. I think it is of therapeutic benefit. In those cases that are not going to recover, the deterioration process is much slower in those patients who work in either some department of the hospital or in some occupational shop.

Notes and Comment.

DR. J. MONTGOMERY MOSHER.

It becomes our painful duty to record the death at his home in Albany, N. Y., of Dr. J. Montgomery Mosher, one of the editors of this JOURNAL.

Dr. Mosher had been, we understand, in his usual health, but was awakened early on the morning of December 7th by severe pain. He notified his wife who summoned medical aid, but Dr. Mosher died shortly after the arrival of the physician.

Dr. Mosher became a member of the editorial staff of the JOURNAL in 1897, the council of the Associationat its annual meeting in May, having selected an editorial staff for the JOURNAL composed of the following members: Dr. Henry M. Hurd, Dr. G. Alder Blumer, Dr. Edward N. Brush, and Dr. J. Montgomery Mosher.

Dr. Mosher from the first took a lively interest in the conduct of the JOURNAL and his assistance and advice have always been of great value.

His associates on the editorial staff soon became aware of his many and varied abilities, and were particularly attracted by his straightfordward, outspoken honesty and his engaging personality.

They desire to put on record their profound sense of great loss, and their most heartfelt sympathy with the family circle from which he has been taken. In the next issue of the JOURNAL a more extended memorial to our departed associate will appear written by one of his former associates no longer actively connected with the editorial staff.

ADEQUATE SUPPORT FOR MEDICAL ACTIVITIES IN STATE HOSPITALS.—This is a season of the year that for many of the medical administrators of state hospitals for mental disorders is one of solicitude. It is the time when in many states legislative bodies will consider the budget requirements of state institutions and by

this action determine the standards the state desires to lay down for the care of its mentally afflicted citizens.

Superintendents and administrators may propose policies that are in harmony with present medical standards and a scientific progress, but whether or not these can be adopted must rest with the representatives of the people.

It has always been an embarrassment to the advancement of psychiatry as a medical subject that its interests were so largely affected by the changing policies of state administration and that the position of state hospitals for the mentally disordered has been such as to limit more than desirable opportunities for personal initiative in endeavors to keep pace with advancements in medical science. This accounts in a considerable degree for the wide differences that exist in institutional facilities and standards in this country.

Those who are familiar with the history of the care of the mentally disordered know how often the medical heads of hospitals have been men of scientific ideals and sound judgment and yet have been forced to shape hospital policies to meet the demands of expediency and ill-considered economies on the part of the state officials.

We are now in a period in which the state must look at its hospital for mental disorders as quite different from custodial institutions for the mentally afflicted. Hospitals must now assume responsibilities of treatment in a broad sense and must adopt methods that the progress of medicine has shown cannot be disregarded if the state is to deal fairly with its citizens. As one becomes familiar with the causes of mental disorders he sees how inadequately we are dealing with these problems. We make provisions for the care of end results of forces and health problems that are still active in community life and yet continue with absolute certainty to pile up burdens for future hospital care. Until legislators and state officials fully grasp these relationships and make provisions for meeting them, hospitals will be held back from attaining their possibilities of greatest usefulness to the state.

In the preparation of budgets hospital administrators have a very clear responsibility for bringing to the attention of legislators and public officials requests for resources that will enable them to maintain the standards of a modern psychiatric hospital. It is

not to be expected that what is needed in medical facilities by an institution can be as readily appreciated by legislators as many other aspects of material needs of such a vast organization as a modern state hospital. It thus becomes a special responsibility of the administrators of a hospital to make clear and insistent those requirements that are essential for maintaining a high medical standard. It is very easy to allow strictly medical interests to became overshadowed by the attractiveness of many other features of development that must always exist in planning the growth and upkeep of a large institution. The difficulties that exist in building up and maintaining a high class medical service in facilities and personnel are so great that it is easy to direct administrative energies into other channels. But it is not buildings and elaborate arrangements that will determine the quality and usefulness of the state hospital for mental disorders. They must be judged by their medical activities and their ability to keep pace with modern medical progress. These are essentially matters of the medical spirit that prevades an institution and are determined almost entirely by the quality of the medical personnel of the institution. Extensive buildings and attractive physical qualities will be wasted unless they are administered by a medical staff of keen scientific spirit, supplied with adequate medical facilities and having a good knowledge of modern psychiatric medicine. No appropriations that do not make this possible can be regarded as adequate. Experience has shown that mental disorders in a relatively large proportion respond to treatment and that the recoveries and improvements that can be obtained will be directly proportional to the standards of medical treatment.

Too generally public interest in state hospitals centers in physical qualities of the institution and has little opportunity for a comparative impression of its medical qualities. It must always be kept in mind that hospitals for mental disorders are fundamentally medical institutions. The maintenance of a close contact with medical progress is all that can keep hospitals from dropping back into the position of custodial institutions—a situation we now like to think of as existing only in the past. If this is done we may be assured of far less criticism of the care of patients and gain a greater sympathy from agencies that are now so ready to criticize.

The scope of what is to be included under the term medical, can, with justice, be very widely extended. In the general field of medicine one finds no limits to the range of methods and agencies that are utilized for the benefit of the sick. Not only are there used the conventional medicinal and surgical remedies, but a vast assortment of physical and chemical medicinal agencies. In our own field one should employ not only all that medicine and surgery have found helpful, but an unlimited variety of agents that have their effects upon the mind. We have learned to appreciate this from the valuable results obtained from the introduction into our hospital treatment of occupational therapy and regulated diversions and exercises.

It is, however, essential both from the need of maintaining a well balanced attitude as well as a regard for economy of money and energy to see that any measures adopted should be the result of careful deliberation and a due consideration for their scientific needs. In selecting these and planning for the medical activities of his hospital the administrator has a responsibility that should be most intelligently directed. It is neither desirable nor fair to the progress of science that boards of control should arbitrarily restrict the adoption of any particular methods of medical treatment that might be recommended by the medical officers of an institution. But on the other hand methods that are not based on true merit or have not received scientific approval should not be suggested by those who are directly in charge of the treatment of patients.

The attitude that should be maintained as to specific lines of treatment must never disregard the fundamental fact that patients come into our state hospitals because of a diseased mind. Whether or not there is also a somatic problem involved, methods of study and treatment must never neglect anything that can be used to bring back the mind into its healthy way of functioning. An assumption that places an undue emphasis on the somatic side is at present not justified by scientific experience. Body and mind are inseparably interrelated and effective treatment cannot be obtained unless this is clearly recognized. The most deplorable position for a hospital to get into is to drift into an indifference towards therapy and to allow its medical spirit to be overcome by inertia and a feeling of the hopelessness of treatment in the psy-

choses. Unfortunately this attitude still exists in institutions that still claim the name of hospitals.

How to bring about a more general and effective appreciation of all that is to be included under the medical needs of our state hospitals is a matter that should interest all that are engaged in psychiatric work. No effort should be spared by hospital superintendents and physicians to keep the medical aspects of their hospital work in the foreground in dealing with state officials and the general public. The public should be taken into the confidence of the administration of hospitals and those who direct the policies of the public press should deal fairly with the difficult problems that must always be coming up even in the best administered hospitals. Instead of the publication of sensational feature stories the press might well devote its energies towards making the public familiar with the real spirit that governs our hospital activities and what possibilities a psychiatric hospital has in aiding in the solution of the vast number of social problems that are continually troubling our states and communities. The press more than any other agency can bring aid to efforts to provide adequate support for providing medical facilities and for the maintaining of high standards of efficiency.

Administrators of hospitals must appreciate the awakened interest that is so widely noticed at this time in the relation of psychiatry to disorders of behavior. They must shape their policies so that they can appeal for public support because of their medical usefulness as public health agencies of the state. They should develop their activities so that they are taking advantage of whatever scientific medical experience has shown to be useful in the treatment of mental disease and that they justify the claims that they are no longer solely custodial institutions but medical hospitals in the fullest meaning of the term.

It is true that in most states the expenditures for the care of the mentally disordered is relatively large, but if the public could only become fully aware of the possibilities of state mental hospitals and of the tremendous factor that mental abnormalities have in our social life one would have a right to expect not only adequate support for their most necessary requirements, but a liberal attitude towards further extensions of their work.

A. M. B.

Association and Hospital Notes and News.

A Woman Member of The New York State Hospital Commission.—Miss Harriet May Mills, of Syracuse, was appointed on January 3, 1923, a member of the New York State Hospital Commission to succeed Cyrus E. Jones, deceased. Miss Mills is widely known for her interest in welfare work and for her advocacy of suffrage for women.

New York's Governor and the Care of the Insane.—Governor Smith, of New York State, in his message to the state legislature on January 3, 1923, outlined his policy with reference to the care of the mentally diseased in these words:

> Some years ago the state undertook, as a state function, the care of the mentally disturbed portion of our population. There are approximately forty thousand people to-day in the state hospitals for the insane. The treatment that they are to receive from the state depends entirely upon the interpretation that you put on the word "care." If we are simply to lock them in and herd them together until their distress of mind is relieved by death, that is one method. If, on the other hand, we are to care for them properly, put forth our best efforts to provide for their needs medically and otherwise, make the very best effort that we can to effect a cure, provide for their physical comfort, we must make such appropriations for maintenance as will secure the best kind of help in adequate numbers.
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> Overcrowding in these institutions is one of the most serious problems confronting the state. I believe that the people want to do everything they can for these unfortunate wards; that the great majority of the people feel that this is an obligation that they should discharge to the very limit of their ability. I, therefore, bespeak your careful attention to proper appropriations for maintenance and a careful study of proposals to add to the existing structures as well as to build new ones of proven necessity in order that we may cure the evil of overcrowding and not overlook the necessity for attendants in adequate number.

Brooklyn, N. Y., State Hospital.—Since 1919 considerable construction work has been done at the Brooklyn State Hospital.

The building west for female patients and the building east for male, accommodating 400 each, including dining rooms, have been completed and are now occupied. A central kitchen serves these two buildings, as well as the reception building for women. Owing to our overcrowded condition, this kitchen, at present, serves about 1600 people. Dining rooms for the employees have been placed in the basements of these buildings.

A new laundry has been built and equipped with modern machinery. Instead of using the old-fashioned drying room, we have installed drying tumblers. All of the different machines have individual motors.

In 1920 the various hospital authorities considered that the old main building was unfit to be used for housing patients, and at an extraordinary session of the legislature, held in September, 1920, authority was given to demolish the old building. At this session, the legislature appropriated for construction and improvement $500,000. We had planned to construct a modern neuro-psychiatric reception service with all facilities for laboratory, research work, prevention, treatment and cure.

Advertisements for the demolition of the west wing were placed in November, and bids received in December, but on advice, awards were not made. After January 1, 1921, we were informed that it would not prove economical to tear down the old building but that it should be repaired and used for housing employees, with the exception of four wards on the extreme eastern end of the east wing. These four wards are to be used as the male reception service. About $100,000 has been expended for renovation and repairs of the west wing, which now houses 135 employees. Female employees are on the second and third floors, while the first floor is given over to married couples. Work on the east wing is at a standstill for the simple reason that funds are not available. The capacity of the hospital is 1190, and our actual daily average is 1600, exclusive of 250 on parole.

Considerable grading of grounds and laying of walks has been accomplished. Shrubs and trees have been set out, and our "front yard" is beginning to look quite attractive.

The most recent construction is that of the administrative and staff building. Owing to lack of space in the heart of the city, we have planned the building on the apartment house type. The

first floor will be used for administrative purposes; the second, third and fourth will be for officers, there being 24 apartments. The apartments consist of a suite of four, three and two rooms each. All of the apartments have their own private facilities. There is a common kitchen, but separate dining rooms for the senior officers, and a congregate one for junior officers. There is a large serving room, with all facilities, including food warmers, tea and coffee urns, dish washer, refrigerator, etc., and between each dining room there is a small serving room. In each end of the building there is a stairway, and in the central portion an elevator. There is an entrance in each end of the building. Arrangements for telephone connections are made for each apartment.

The Creedmoor Division is located four miles northeast of Jamaica, and is our farm colony. We have had about 140 patients there during the last four years. In 1920, by legislative act, the Creedmoor Division was placed in the hands of a military commission, and $3,000,000 was appropriated for construction of a military hospital to be used for the "World War" soldiers of this state. The construction of this hospital did not progress. In 1921, the law was repealed and the property returned to the Brooklyn State Hospital and the money reappropriated for the construction of a modern hospital, to be known as the Brooklyn State Hospital, Creedmoor Division. Plans and specifications have been completed for the construction of one group of buildings to accommodate 800 patients. The plans include kitchen and dining rooms, a power house, railroad spur and sewage disposal beds. The construction is of the pavilion type connected by corridors. In the corridors between each pavilion are a few single rooms, a reception, boot and coat rooms. Porches extend the length of the corridors. The dining rooms are built around the kitchen, with corridors between kitchen and dining rooms. These corridors are utilized as serving rooms in which there is placed dish washers, tea and coffee urns, etc. Each dining room will accommodate 50 patients.

Our greatest handicap during the past few years has been, and is, lack of efficient help on the wards and on medical staff.

Our admission rate has been very large. For the year 1921, it was 922; for the year 1922, 1125. During the past year the

total number under treatment was 2616. Our bed cases average more than 200 per day and our surgical dressings were on the average of 60 a day. A large proportion of our people are the feeble or infirm, and the very disturbed and troublesome.

DR. COE'S GIFT TO PORTLAND, ORE.—Dr. Henry Waldo Coe, medical director of the Morningside Hospital, Portland, Ore., and for a quarter of a century a member of the American Psychiatric Association, has presented to the city of Portland an equestrian statue of Theodore Roosevelt, which was unveiled on November 11, 1922, with appropriate ceremonies at Portland.

The statue is of heroic size and represents the ex-president clad as a rough rider seated on a spirited charger. Dr Coe has been a lifelong friend and ardent admirer of Theodore Roosevelt, whose statue he has dedicated to the children of America.

Dr. Coe is to be congratulated upon his public spirit as well as upon the ability to give it expression in such generous fashion, and the city of Portland is likewise to be congratulated upon the possession of a citizen of Dr. Coe's quality.

ILLINOIS STATE HOSPITAL MEDICAL SERVICE BULLETIN.—This Bulletin, of which we have received Volume I, No. IV, is issued bi-monthly from the Division of the Alienist, Department of Public Welfare, and is edited by Dr. Charles F. Reed, State Alienist.

The Bulletin will be a valuable means of communication between the various state hospitals, and the editor evidently intends that it shall be a stimulus to better work in the hospital wards and laboratories.

We would call the editor's attention to the fact that this JOURNAL is now THE AMERICAN JOURNAL OF PSYCHIATRY, and has been published under that title since July, 1921, and that the reference to the May, 1922, issue of the JOURNAL should have been to the July issue, as we have no May number.

Obituary.

DR. ISAAC MONTROSE TAYLOR.

Isaac Montrose Taylor died November 26, 1921, at his home in Morganton, N. C. He was born in Newbern, N. C., on October 29, 1857. His father was Alexander Taylor, a physician, and his mother was Sarah A. (Cole) Taylor. In 1879 he graduated from the University of North Carolina with the degree of Ph. B., and in 1882 he received the degree of Doctor of Medicine from the College of Physicians and Surgeons in New York City. In 1889 he was united in marriage to Susan M. Evans, of Fayetteville, N. C.

For a period of about four years after graduation Dr. Taylor was engaged in private practice in a rural district in Rowan County, N. C. I have been told by Dr. John Whitehead that as a family physician Dr. Taylor greatly endeared himself to his people—by his careful medical attention to them, by his integrity, by his keen sense of humor, and by his comforting sympathy. In 1886 he became a member of the medical staff of the State Hospital at Morganton, which was known at that time as the Western North Carolina Insane Asylum. During the latter years of this service he was first assistant physician, and this responsible and difficult post he occupied to the entire satisfaction of his superior, Dr. P. L. Murphy, the distinguished superintendent, as well as to the board of directors. The patients were devoted to Dr. Taylor, because he gave himself to them freely and without stint. This service in the state hospital under the tutelage of Dr. Murphy gave Dr. Taylor excellent training, and in 1901 he resigned from the staff of that institution, and established in Morganton a private sanatorium—Broadoaks—for the treatment of nervous and mental diseases. Although Broadoaks was the pioneer private hospital in the state for the treatment of such diseases it immediately attained success, because it bore the impress of its founder's ability and character.

Dr. Taylor's attainments were recognized by his fellow physicians, and they drafted him for service in various capacities. For several years he was a member of the local board of health, and in 1915-16 he was president of the Board of Medical Examiners of North Carolina. His membership in the state medical society was long-standing. He held fellowship in the American Medical Association; in the American Medico-Psychological Assocation (now the American Psychiatric Association); the Tri-State Medical Association, and the Southern Medical Association. Immediately upon the entrance of the United States into the European war Dr. Taylor offered his services to his country, but he was detailed for duty at home as a member of the Medical Advisory Board.

Dr. Taylor had an intelligent interest in practically everything—in mankind, in nature, in medicine, in things of this world, and of those beyond mortal vision, he thought much but said little. Sometimes his articulation exhibited some difficulty or tardiness, but he never experienced mental doubt or confusion. He knew what he thought, his vocabulary was large, his diction excellent, his expressions were often epigrammatic.

His temperament was judicial. He never lost his equilibrium. He developed opinions of his own, respected them, and was willing to stand by them even if the crowd left him standing alone. He was often called into court in medico-legal cases. On such occasions he exhibited always high courage, extreme modesty, but always a thorough understanding of the situation. He was always embarrassed by being seated in a position so conspicuous as the witness chair. Even though his modesty was made to suffer because of such a situation, he never lost his head, and always he was able, even in the hands of the ablest barrister, to take excellent care of his opinions.

Dr. Taylor was exceedingly frank and sincere and outspoken. He hated sham and pretense and insincerity. He was loyal to his friends, to his profession, to his church, the Episcopalian, and to his state.

But in spite of the fact that his work brought him into daily contact with sorrow and distress and even though he saw souls laid bare, he was charitable, because he saw always with a deep-seeing eye and an understanding heart, and he knew human frailties.

He gave himself and of his substance. He loved young people because he himself was young in spirit, and young people loved him. No accumulation of years could have made him old. Eternal youth lived in his heart.

His departure from amongst us is a personal loss to his many friends and a public loss to his state and profession.

J. K. H.

CHARLES SPENCER KINNEY, M. D.

Dr. Charles Spencer Kinney was born in Suffield, Conn., April 13, 1865. His father, Timothy William Kinney, was of Scotch descent and Puritan stock, his family having come to Salem from England in the seventeenth century. His mother, Ann Elizabeth Fay, was of English ancestry. The family lived in Vermont during the Revolutionary period and was prominent in patriotic movements of the times.

Dr. Kinney was educated in the public schools of Hartford and at the Connecticut Literary Institute. He was graduated from the New York Homeopathic Medical College in 1879 and the following year was appointed assistant physician at the Middletown State Hospital at Middletown, N. Y. His keen interest in his work, his unlimited energy, his professional and executive ability and his thoughtfulness of those under his charge, won for him recognition and he was advanced to the position of first assistant physician. In 1900 he resigned, purchased and became proprietor of the Easton Sanitarium at Easton, Pa., which institution he conducted until the time of his decease on October 26, 1920.

During the forty years of his active medical practice his interest in those mentally ill never flagged. He was a constant reader of the literature of psychiatry, a member of many medical societies, a frequent visitor to medical gatherings and clinics in this country and from many trips abroad was acquainted with the work being done there. He early adopted the " Hospital Idea " and applied it in both state and private practice. Careful and painstaking investigation into the physical and mental states of his patients, personally supervised nursing, skillfully selected diets and wise prescribing won for him the gratitude of hundreds restored to health. He contributed many papers to the literature among which were

"Worry," "Melancholia and Its Treatment," "Prodromal Stage of Insanity and Treatment During It," "Causes of Insanity," "Treatment of Chronic Inebriates," "Drug Psychosis and Its Treatment" and "Alcoholism." He became a member of this society in 1901.

Dr. Kinney was a man of high ideals and his life was spent in unselfish devotion to them. His natural tact, diplomacy and courtesy to all with whom he came in contact were tempered with a firmness and straightforwardness which did not permit of misunderstanding. He was generous to a fault and I believe obtained his greatest pleasure from kindnesses and material aid rendered to others. He was a Mason, a member of the Presbyterian Church and a practical Christian.

He is survived by his wife, Jane Dill Kinney, two sons, Dr. Selden T. Kinney and Harry D. Kinney, and a sister, Miss Florence F. Kinney.

W. E. L.

HANSELL CRENSHAW, M. D.

Dr. Hansell Crenshaw, aged 44, son of Dr. and Mrs. Wm. Crenshaw, died August 20, 1921, at his home in Atlanta, Ga. His health while greatly impaired after his service in the World's War, did not impress on his friends that the end was near at hand, but it was not a surprise to him. He heard th[illegible]ead of the great destroyer and spoke freely of his approach.

He was one of the organizers of The Atlanta Neurological Society and its first president. By nature he had a wealth of personal magnetism, his character was free, open and generous, his nature was lovable. In his profession, that he loved so well, he was rapidly rising to its zenith. He was eminently social in his feelings, enjoying with the greatest zest the companionship of old, tried and trusty friends. Favors done were never forgotten by him, but always repaid with interest when opportunity afforded. At the friendly fireside and the festive board he presided the acknowledged chief. It would be a task to find in any circle his peer for the combination of these qualities, of head and heart, that shows out in every feature and found vent in every expression, diffusing around him the good will and happiness of his genial

nature. His steps were all in the paths of service and benefaction, so much so that when the hour came " of which no man knoweth," he was ready to pass fearlessly through " the valley of death," and he has left a memory of a peaceful and upright example, that the medical profession will cherish. Many a flower cultivated by him to shed its fragrance to every passer by will long plead for kindly thought of him, in whom the gentle and kindly elements so mixed that it would not be exaggerating to say, in the language of the poet:

From nature's mould ne'er came a better man.

J. C. K.

DR. J. ANSON SMITH.

J. Anson Smith, son of Dr. Henry A. M. and Elizabeth W. Smith, was born in Gloucester City, N. J., November 23, 1871. His early education was obtained at Sunnyside Academy, Ambler, Pa. He was graduated from the Biological School, University of Pennsylvania, in June, 1893, and from the Jefferson Medical College in June, 1897.

On October 2, 1897, he went to Blackwood, N. J., taking the practice of the late Dr. Henry E. Branin, also filling Dr. Branin's unexpired term as medical director of the Camden County Hospital for the Insane. In January, 1898, he was elected medical director of that institution which office he faithfully fulfilled in connection with his extensive practice until April, 1921, when he gave up his private practice and was elected superintendent of the Hospital for the Insane, acting as such until his death on October 27, 1921.

At the time of his death Dr. Smith was an elder in the First Presbyterian Church of Blackwood, N. J., a member of the board of education, a director of the South Jersey Bank of Blackwood, and vice-president of the Blackwood Building and Loan Association. He was a member of the Camden County Medical Society, the Philadelphia Medical Society and the American Medical Association.

Dr. Smith is survived by a widow, Annette B. Smith, and a son 10 years of age, Henry Branin Smith, who reside at Blackwood, N. J.

H. C. C.

DR. FLORENCE HALE ABBOT.

Dr. Abbot was born in Wilton, N. H., October 20, 1867, the daughter of Harris and Caroline (Greely) Abbot. She prepared for college at Pembroke and Cushing Academies, and graduated from Smith College in 1891.

She taught in Pembroke Academy, 1891-1892, and in Bermuda, 1892-1893. She entered the New York Medical College for Women in 1893, and graduated in 1897. After one year in the Women's Hospital at Philadelphia she became assistant physician at the Medfield State Hospital, remaining until 1903, assistant physician at the Taunton State Hospital, 1903-1908, at the Worcester State Hospital, 1908-1910, at Dr. Mellus' Hospital, West Newton, Mass., from 1910-1917, when she was appointed senior assistant physician at the Boston State Hospital.

As a physician and a psychiatrist she was recognized as one of the best in Massachusetts. As a friend she was most loyal and devoted. Her wise counsel was always greatly appreciated among her associates.

Dr. Abbot died August 1, 1921.

E. C. N.